GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: May 16, 1978

Project Title: Automatic Direction Finding Equipment Evaluation

Project No: A-2134

Project Director: Mr. T. F. Divine

Sponsor: Naval Electronic Systems Command; Code 2603; Washington, DC 20360

Agreement Period: From 4/10/78 Until ~~10/9/78~~ 30 Mar 79 (R&D Performance)

Type Agreement: Contract No. N00039-78-C-0224

Amount: $47,976

Reports Required: Test Plan; Test Report; Engineering Drawings & Lists.

Sponsor Contact Person (s):

Technical Matters
Mr. Robert Reece
Naval Electronic Systems Command
ATTN: Code PME 107-144
Washington, DC 20360
Phone: (202)692-3741

Contractual Matters
(thru OCA)
ONR Resident Representative
Room 325, Hinman Research Bldg.
Ga. Tech Campus

Defense Priority Rating: DO-A7 under DMS Reg. 1

Assigned to: Radar Instrumentation Laboratory (School/Laboratory)

COPIES TO:

- Project Director
- Division Chief (EES)
- School/Laboratory Director
- Dean/Director–EES
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- Procurement Office
- Security Coordinator (OCA)
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- EES Reports & Procedures
- Project File (OCA)
- Project Code (GTRI)
- Other

CA-3 (3/76)

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION

Date: April 15, 1981

Project Title: Automatic Direction Finding Equipment Evaluation

Project No: A-2134

Project Director: J. S. Ussailis

Sponsor: Naval Electronic Systems Command; Code 2603; Washington, DC 20360

Effective Termination Date: 3/30/79

Clearance of Accounting Charges: 3/30/79

Grant/Contract Closeout Actions Remaining:

- X Final Invoice and Closing Documents
- _ Final Fiscal Report
- _ Final Report of Inventions
- X Govt. Property Inventory & Related Certificate
- _ Classified Material Certificate
- _ Other _____

Assigned to: RAIL (School/Laboratory)

COPIES TO:

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Accounting Office
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Project File (OCA)
Other: _____

A-2134

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

17 May 1978

Commander
Naval Electronic Systems Command
Washington, DC 20360

Attention: Mr. Robert Reece
PME 107-144

Reference: Contract N00039-78-C-0224

Subject: Monthly Progress Letter No. 1
10 April 1978 - 30 April 1978

Gentlemen:

During late March and the month of April, work began on the development of the Five Channel Microwave Instrumentation Receiver. Primary emphasis was placed on the identification and order of long lead-time material required for receiver fabrication. The material which has been placed on order is identified in Enclosure 1 and represents an encumbrance of $26.5K or 80 percent of the direct material (purchased parts) authorized under the contract.

Work has begun on the functional and physical partitioning of the receiver system. The ideal choice of physical partitioning is influenced by the operational deployment of the system (e.g., piling, buoy, or platform). Since the details of the operational deployment of the system are uncertain, a submersible container adequate for housing the remote receiver subsystem and associated power supplies have been identified. Since the container can be used for most conceivable deployments of the receiver, the receiver physical design can proceed.

Work has begun on the Equipment Test Plan (Sequence No. A001 of Contract Data Requirements List). The proposed format of the Equipment Test Plan would include: (1) an analysis of a realistic test configuration including propagation and receiving antenna array considerations, (2) a brief development of receiver performance objectives based on the test, and (3) a brief description of the test procedures used to verify the baseline performance of the receiver. The receiver performance characteristic of primary importance is power ratio measurement accuracy, which can be directly related to DF errors in an amplitude comparison direction finding system. Secondary performance characteristics of interest include sensitivity and dynamic range. The Test Plan submission will be delayed until the receiver deployment plan is firm.

During the reporting period the total and direct wage expenditures were approximately $2.4K and $1.4K respectively. The Materials and Supplies identified in Enclosure 1 will be reported as actual expenditures during subsequent reporting periods.

Respectfully submitted,

T. F. Divine
Project Director

APPROVED:

D. K. Plummer
Head, EM Surveillance Branch

TFD:nsb

Enclosure

Enclosure 1

Materials and Supplies on Order

VENDOR	MATERIAL DESCRIPTION	APPROXIMATE COST	DELIVERY
RHG Electronics	Mixers (5) Log IF Amplifiers (5) Linear IF Amplifiers (5) IF Discriminator (1)	$8,718	120 days
Hewlett-Packard	Programmable Attenuators (6) Coaxial Switches (4)	$6,235	21 days
NARDA	Power-Dividers (3)	$ 735	56 days
OMNIYIG	YIG & YIG-Tuned Gunn Oscillators (3)	$5,020	-------
CIRQTEL	Harmonic Rejection Filters (2)	$ 161	49 days
NARDA	Directional Couplers (5) Fixed Attenuators (5)	$2,088	30 days
DATEL	Sample/Hold Modules (10)	$1,790	-------
Micronet Works	Analog-to-Digital Converters (10)	1,765	-------
	Grand Total	$26,507	

A-2134

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

21 June 1978

Commander
Naval Electronics Systems Command
ATTN: Mr. Robert Reece
PME 107-144
Washington, DC 20360

REFERENCE: Contract N00039-78-C-0224

SUBJECT: Monthly Progress Report No. 2, 1 May 1978 - 31 May 1978

Gentlemen:

During the month of May the primary contract activity concerned the details of the receiver signal processing and control design. While these designs were not completed during the reporting interval, they were pursued in sufficient depth to identify a majority of the materials (circuit components, etc.) necessary to implement the ancillary receiver function. This material has been placed on order.

Feedback concerning the long lead time items discussed in Monthly Progress Letter No. 1 indicates that some material (notably rf components) may not be received until late (eg. September) in the contract period. At this point it appears that sufficient parts are on-hand under Contract N00039-74-C-0278 to permit the construction and test of one receiver channel rf chain. It is requested that appropriate approval be given for the use of suitable N00039-74-C-0278 components in the execution of this contract.

During the reporting period, the direct wage expenditures were approximately $2.8K. The total expenditures and/or encumbrances for the month were $22.9K. The total free balance remaining in the contract budget is $22.7K. The enclosed figure illustrates the contract expenditures and budget projections over the contract's duration. A similar figure will be provided in future progress reports.

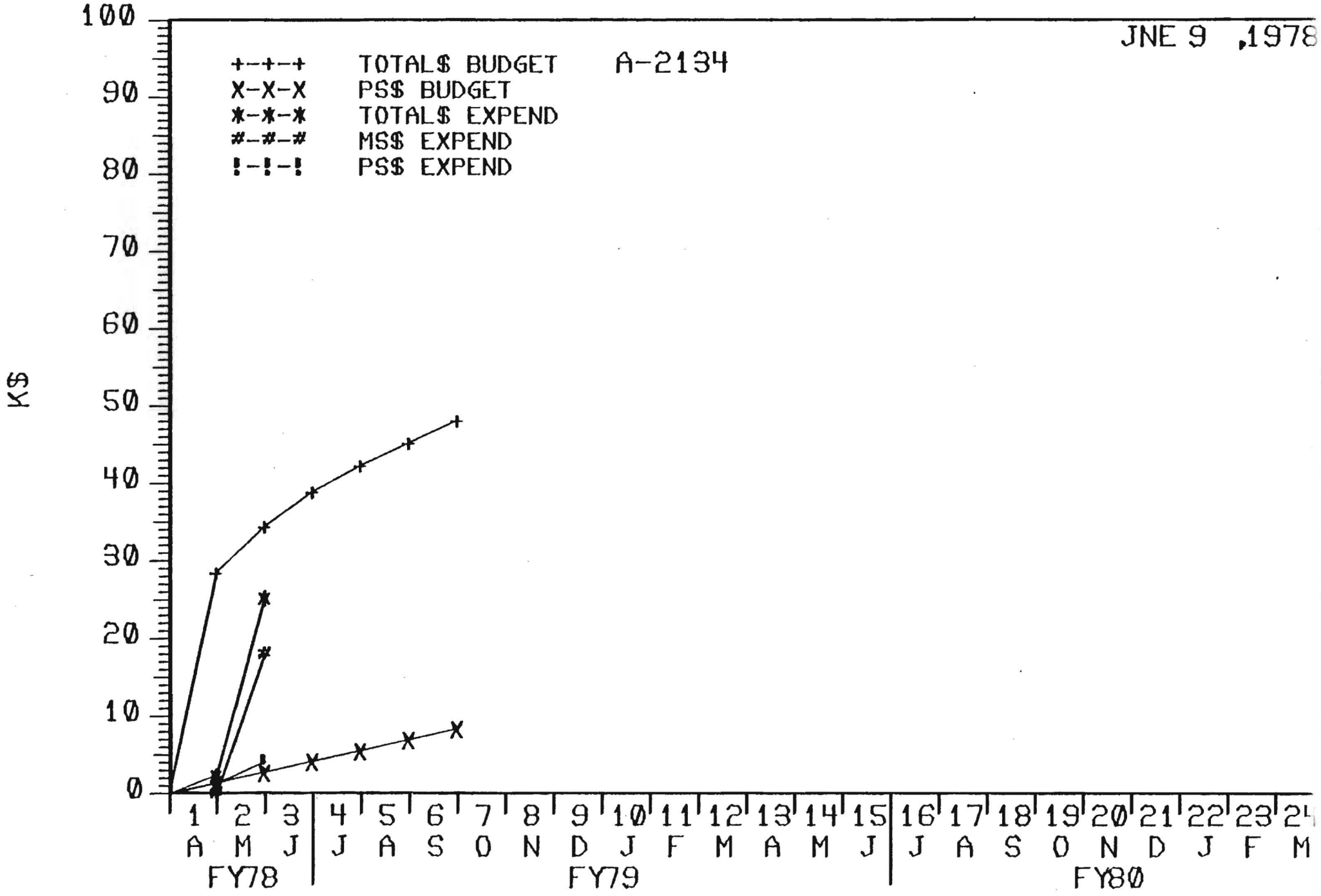
Respectfully submitted,

T. F. Divine
Project Director

Approved:

D. K. Plummer
Head, EM Surveillance Branch

Enclosures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A-2134
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A M J J A S O N D J F M A M J J A S O N D J F M
FY78
FY79
FY80

A-2134

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

21 May 1979

Department of the Navy
Naval Electronics Systems Command
Washington, D.C. 20360

Attention: Mr. Robert Reece
Code PME 107-14

Reference: Contract No. N00039-78-C-0224
"Assembly and Test of Instrumentation Receiver for Automatic Direction Finding Equipment Evaluation
Georgia Tech/EES Project A-2134

Subject: DD1423 No. A001, Equipment Test Plan

Gentlemen:

Attached to this letter is an equipment test plan for your review and approval.

Respectfully submitted,

James S. Ussailis
Project Director

JSU/c
Att.

Approved:

H. L. Bassett, Chief
ESM Division

EQUIPMENT TEST PLAN

Assembly and Test of Instrument Receiver
for Automatic Direction Finding Equipment Evaluation
Project A-2134

Prepared for

Naval Electronics Systems Command - Code PME 107-14
Washington, D.C.

Contract No.
N00039-78-C-0224

Prepared by

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Radar and Instrumentation Laboratory
21 May 1979

I. INTRODUCTION

This document describes qualification tests of the receiver for the Automatic Direction Finding (ADF) Test Program to be conducted by Georgia Tech at the Naval Coastal Systems Center (NCSC). It is submitted in fulfillment of contract data requirement list item A001 under Contract N0039-78-C-0224 describing the purpose of the entire experiment and contains a general description of test sites, equipment to be used and experimental procedures. This Receiver Test Plan compliments and expands on the Experiment Test Plan.

The philosophy of testing the receiver is substantially different from a qualification test for an item of purchased equipment or for procurement of a device utilized in an operational environment. The underlying purpose behind these tests is to ensure that the characteristics of the receiver will permit meaningful data to be collected and that characteristics describing the operation of the receiver are accurately recorded. In keeping with this philosophy, detailed tests of the individual receiver components, while a necessary part of the development program, are not specified as part of the Receiver Test Plan. Only their performance, when embedded as part of the overall system, has meaningful impact on the receiver characteristics which are important to this experiment.

Since a primary objective of these tests is to accurately record receiver characteristics rather than to determine compliance with a set of specifications, the go/no-go results are established to encompass a relatively wide range of receiver parameters. The tests are designed to record the maximum amount of data useful in characterization of the data acquisition and analysis system.

The following section describes a receiver qualification test procedure consisting of a number of individual performance tests to be carried out before equipment is sent to the field.

II. RECEIVER QUALIFICATION TEST PROCEDURES

A. Purpose

The purpose of these test procedures is to ensure that characteristics of the receiver are suitable for the ADF Measurement Program, that the characteristics of the receiver are accurately recorded for use in subsequent data analysis and to answer any questions concerning receiver performance which might arise. It is specifically not intended that the receiver satisfy a set of military specifications, that it be capable of operating over an extreme temperature range or that it be operated by other than trained scientific personnel.

B. Location

The receiver qualification test procedures will be performed at the contractor's facilities, Georgia Tech Research Facility, Cobb County, Georgia.

C. Test Instrumentation and Calibration

Standard Georgia Tech calibration procedures established by our instrumentation calibration laboratory will be used to calibrate all appropriate test equipment utilized during the program. It is anticipated that all equipment for these experiments will be owned by Georgia Tech and subject to these calibration requirements. Appropriate descriptive information concerning the identity of this equipment will be recorded on the appropriate data sheets.

D. Support Requirements

All necessary support will be provided by the contractor.

E. Test Descriptions

Five major tests will be performed as part of the qualification test procedures.

E.1. Bandwidth

The objective of this test is to determine the nature of the receiver passband, the levels of voltage output, the saturation levels of the system and the variation in bandwidth with changes in input signal strength. These tests will be conducted at center frequencies of approximately 3.0, 9.5 and

14.5 GHz. They will encompass a range of input power from 0 dBm to less than -70 dBm. Figure 1, a simplified block diagram of the system, shows the use of a swept frequency source, a calibrated attenuator, an oscilloscope display and a camera or an X-Y chart recorder to record results. A sweep width of 200 MHz about the center frequency will be established, the receiver tuned to that center frequency and the scope utilized to display a trace of detected receiver output as a function of input frequency. A value input power will be stepped in 10 dB increments from 0 dB to less than -70 dBm and will be utilized in separate steps and recorded by sequential exposure on the same film. It is anticipated that a 3 dB bandwidth of approximately 50 MHz will be obtained, and that this value will be no greater than 100 nor less than 35 MHz. Recorded data will be carefully annotated to indicate output voltage levels and the association of receiver bandpass traces with input signal power.

E.2. Spurious Responses

E.2.a. Spurious Signal Response

The same data recording scheme will be used as with the bandwidth measurements above, but the sweep width will be increased so the 1 to 15 GHz range will be covered. The plots of receiver output as a function of input frequency will again be recorded for input signal values of -10, -30 and -70 dBm. Data shall be carefully examined to ensure that spurious responses are at least 40 dB below those desired.

E.2.b. Intercept Point

A two-tone intermodulation distortion measurement will be performed in the vicinity of 3.1 GHz (Figure 2) and the results plotted on log-log graph paper to determine both the third order intercept point[1] and the 1 dB compression point.

E.3. Equivalence of CW and Pulsed Measurements

A calibrated crystal detector will establish equivalence in peak power between a CW signal and a pulsed single frequency signal. These signals will be sequentially injected into the receiver at operating frequencies of 3.1, 9.5 and 14.5 GHz to ensure that the output signal is independent of

---

[1]Electronic Design, 1 Feb. 1967. "Don't Guess the Spurious Level," McVay, Franz C.

pulse length. Continuous wave signals and pulse signals having pulse lengths 2, 1, 0.5 and 0.25 microseconds will be utilized. A simplified block diagram of the measurements set-up is included as Figure 3.

E.4. Minimum Detectable Signal

The test set-up described in Figure 3 will be utilized with a 1.0 microsecond wide pulse to establish the level of minimum detectable signal. While this signal is a difficult measurement to make, the use of tangential signal sensitivity provides a much more repeatable value. At least three measurements of tangential signal sensitivity will be made by a minimum of three different operators at each frequency in order to establish the level of tangential sensitivity, the average of these readings being the measured value. The known relationship between minimum detectable signal and tangential signal sensitivity will then be used to determine the minimum detectable signal for the system.

E. 5. Logarithmiticity

The linearity of the transfer function between detected signal output of the receiver and the input signal power in dBm will be established utilizing the experimental set-up described in Figure 4. A continuous wave injected signal tuned to the receiver's center frequency will be stepped in 5 dB increments throughout the receiver's dynamic range to ensure a linear and known relationship between receiver input power in dBm and signal output. If deviations over a 50 dB dynamic range from a straight line of less than 1 dB cannot be achieved, the experiment will be repeated using 2 dB increments. Tests will be performed at a center frequency of 3, 9.5 and 14.5 GHz at 15°C, 20°C, 25°C and 30°C ambient temperature.

F. Delivery of Documentation

Within thirty days after completion of the receiver qualification test procedures, copies of all completed data sheets and a copy of the receiver test plan will be forwarded to the sponsor for his records. Included in this data package will be a letter discussing deviations of the results from expected values and indications of the impact of these deviations on the experiment.

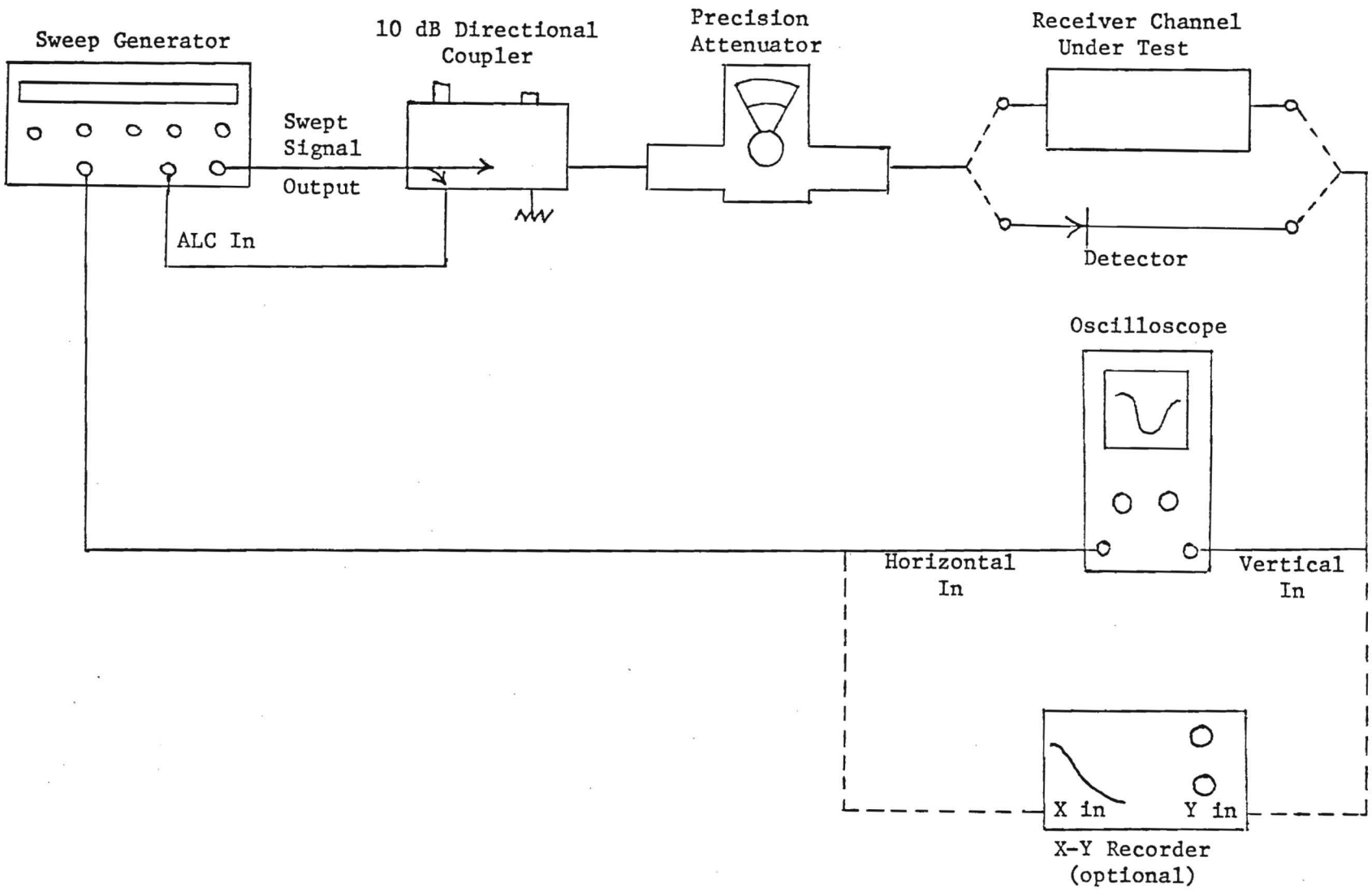

Figure 1. Block Diagram of Swept Bandwidth Measurement

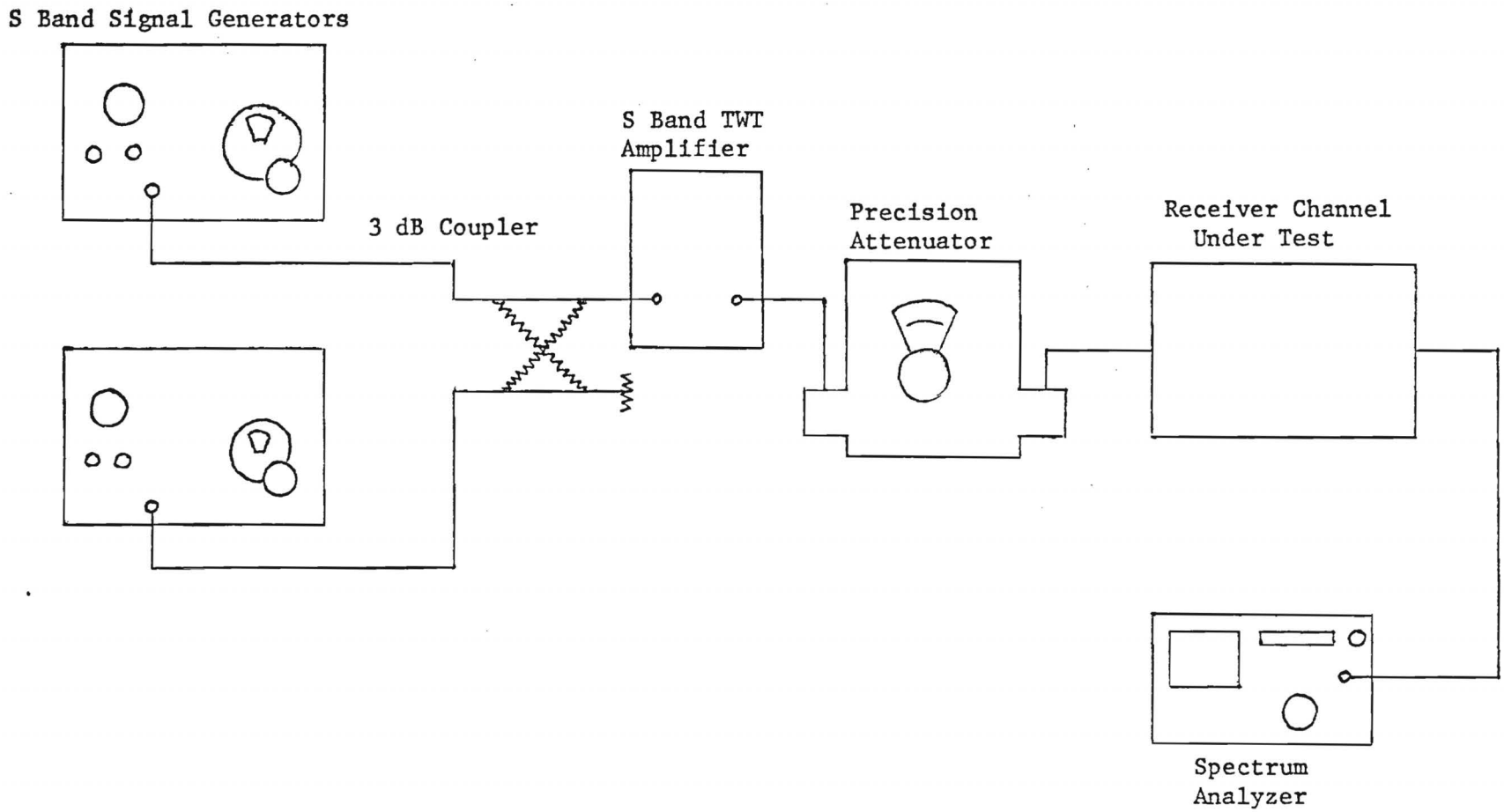

Figure 2. Block Diagram of Intermodulation Distortion Measurement

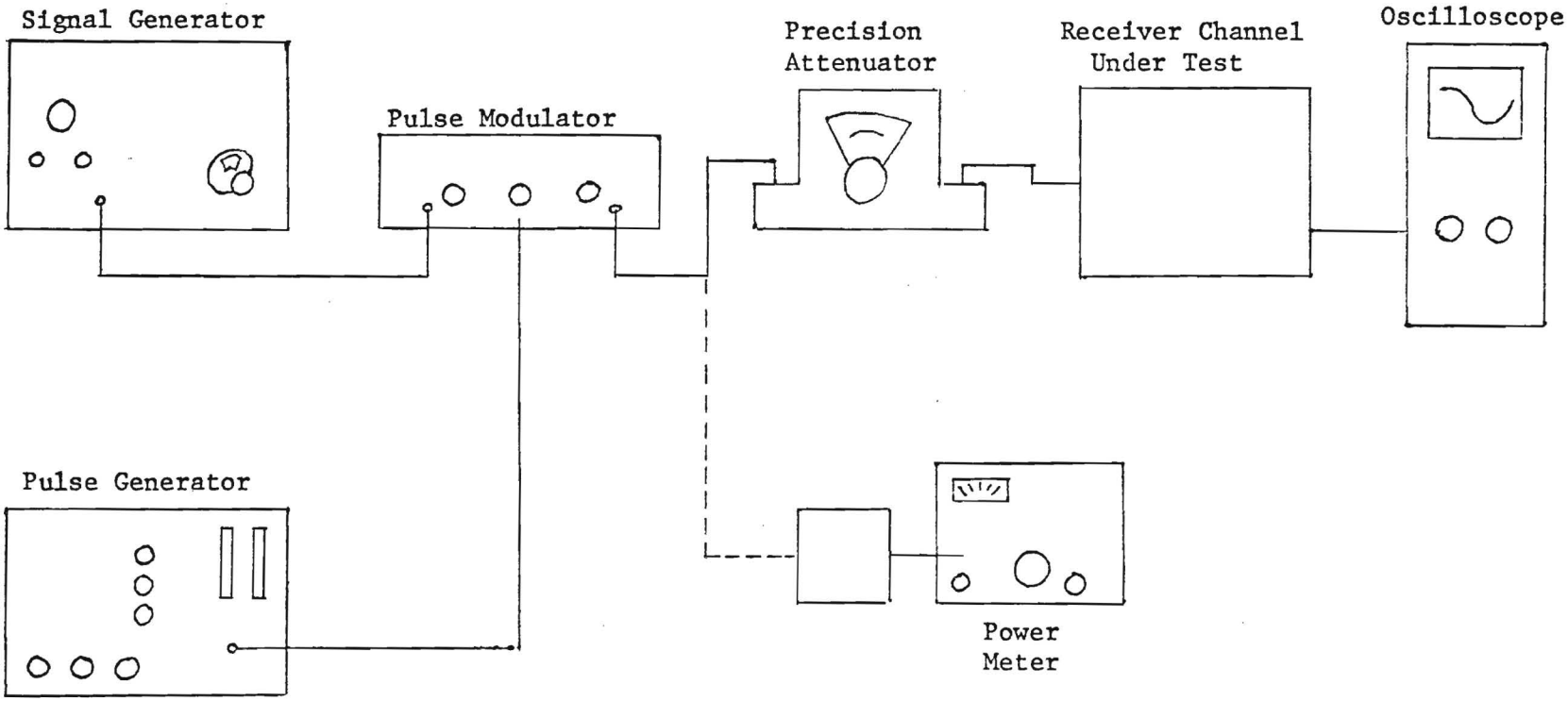

Figure 3. Block Diagram of Equivilance and Tangential Sensitivity Tests

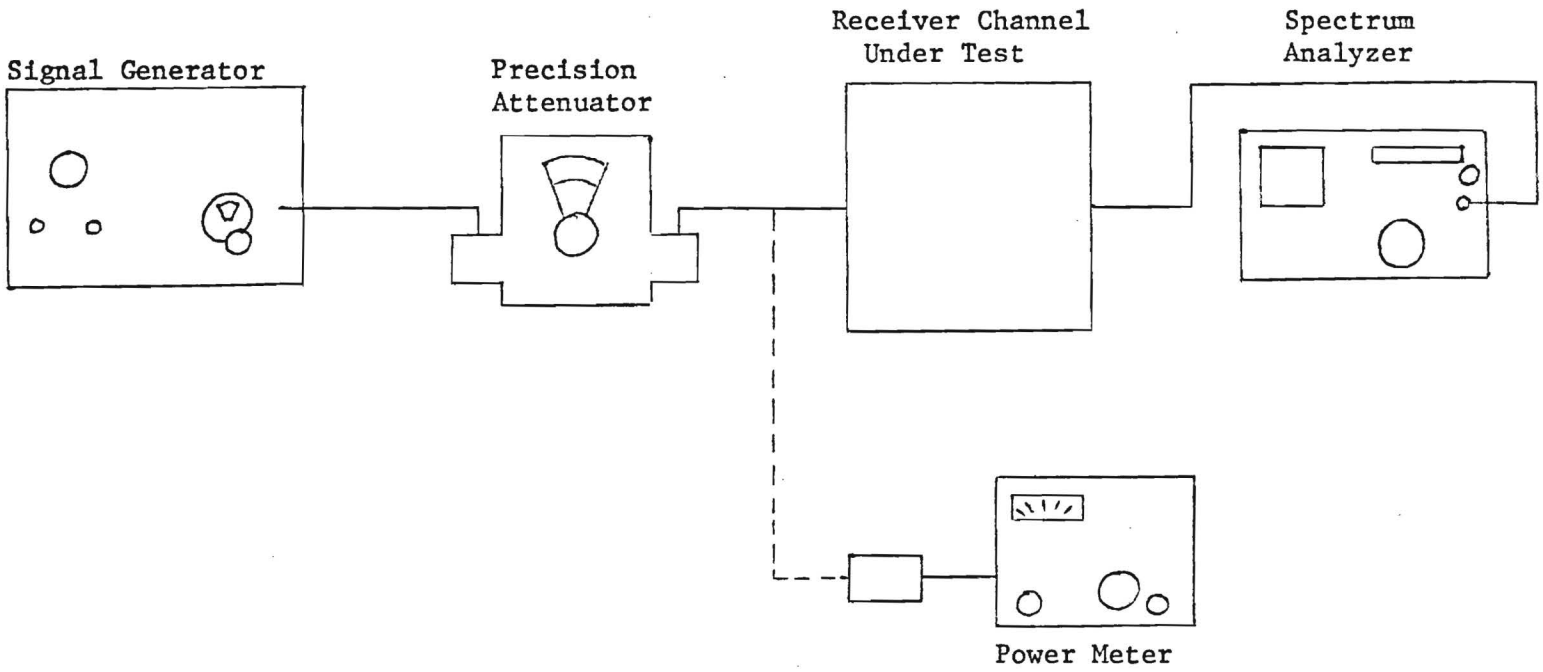

Figure 4. Block Diagram of Logarithmiticity Test

A-2134

Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

26 March 1981

Department of the Navy
Naval Electronics Systems Command
Washington, D.C. 20360

Attention: Mr. Ed Walsh
Code PME 107-14

Reference: Contract No. N00039-78-C-0224
"Assembly and Test of Instrumentation Receiver for Automatic Direction Finding Equipment Evaluation"
Georgia Tech/EES Project A-2134

Subject: DD1423 Item A002 - Test Report

Gentlemen:

Attached to this letter is a test report for your review and approval. This report is the result of testing undertaken in accordance with DD1423 Item A001, Equipment Test Plan.

Respectfully submitted,

James S. Ussailis
Project Director

JSU/c
Attachment

APPROVED:

Harold L. Bassett, Chief
Modeling and Analysis Division

REPORT APPROVAL SHEET

DUE DATE:

I. _____ PROJECT NO. A2134
(Report Type and No.)

REPORT TITLE Assembly and Test of Instrumentation Receiver for Automatic Direction Finding Equipment Evaluation

REPORT AUTHOR(S) James S. Ussailis and Keith D. Vaughn

PROJECT DIRECTOR James S. Ussailis DIV./BR. RAIL/MAD

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SEE REVERSE SIDE FOR INSTRUCTIONS

Form EES 722 (R-2-70)

GIT/EES Project A-2134

ASSEMBLY AND TEST OF INSTRUMENTATION RECEIVER FOR AUTOMATIC DIRECTION FINDING EQUIPMENT EVALUATION

by

J. S. Ussailis
K. D. Vaughn

Contract No. N00039-78-C-0224

Submitted to

Department of the Navy
Naval Electronics Systems Command
Washington, D. C. 20360

March 1981

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Atlanta, Georgia 30332

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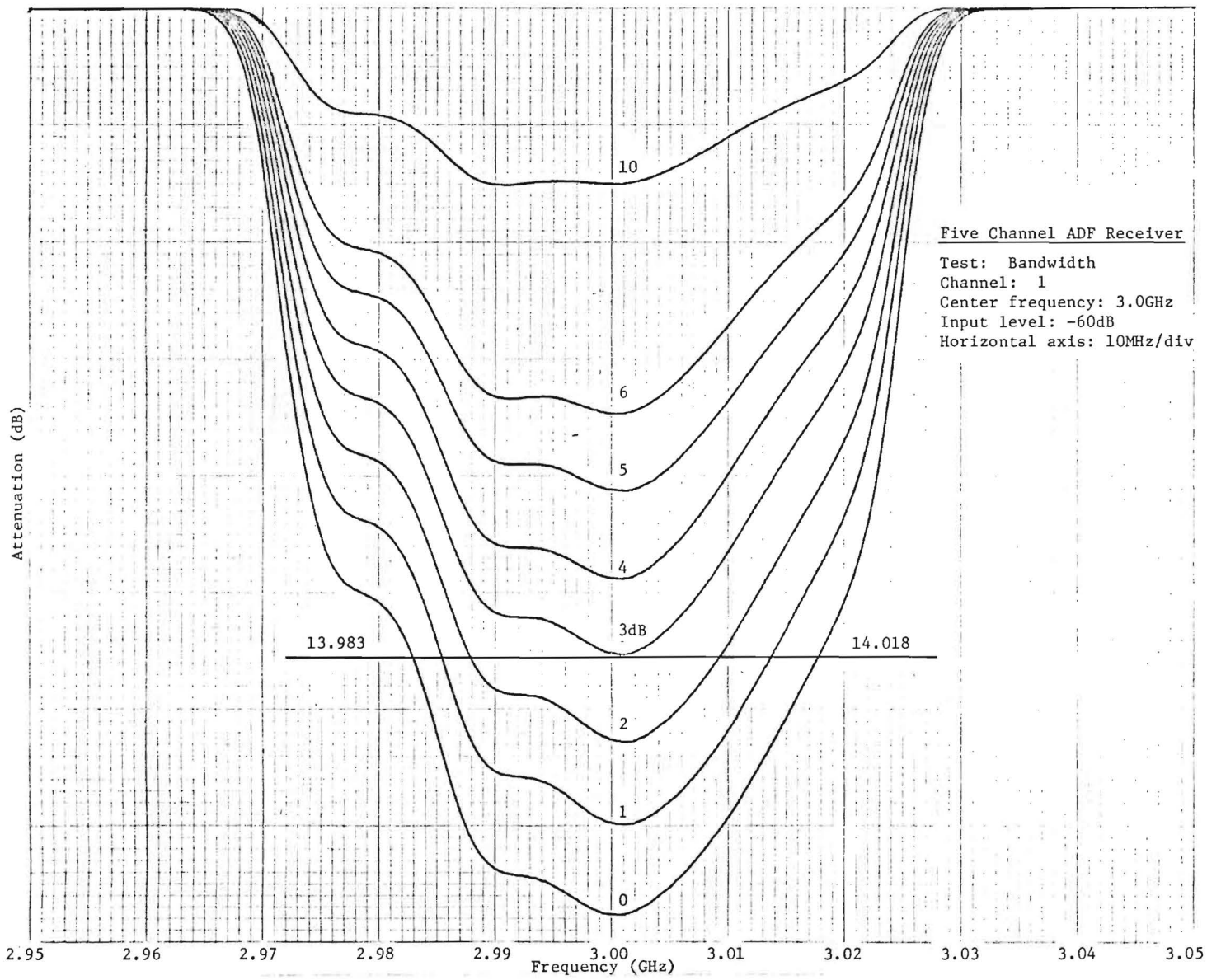
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5
4
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14.018
2
1
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Attenuation (dB)
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2.97
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3.00
3.01
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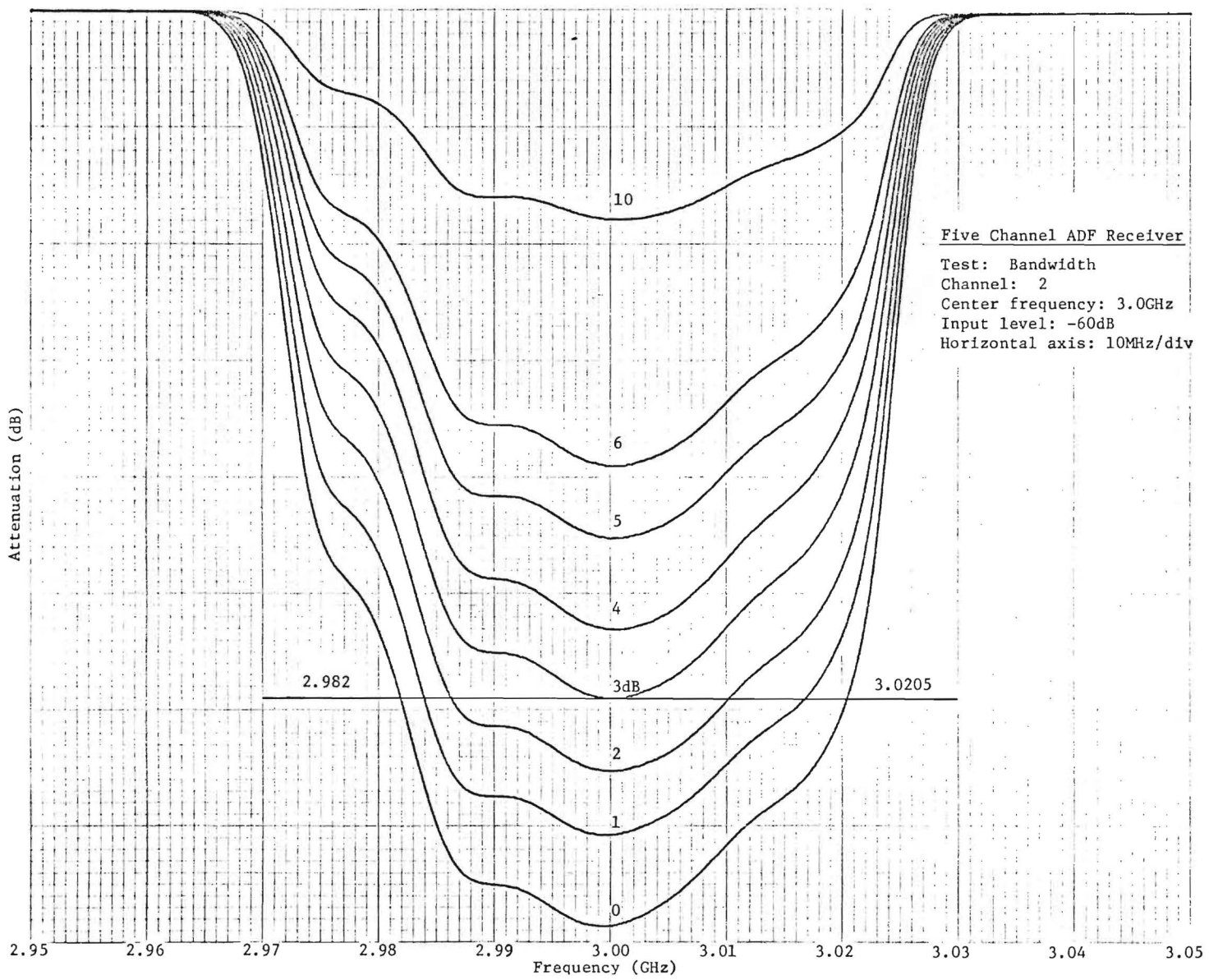
3.03
3.04
3.05
Frequency (GHz)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5
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3.0205
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1
0
Attenuation (dB)
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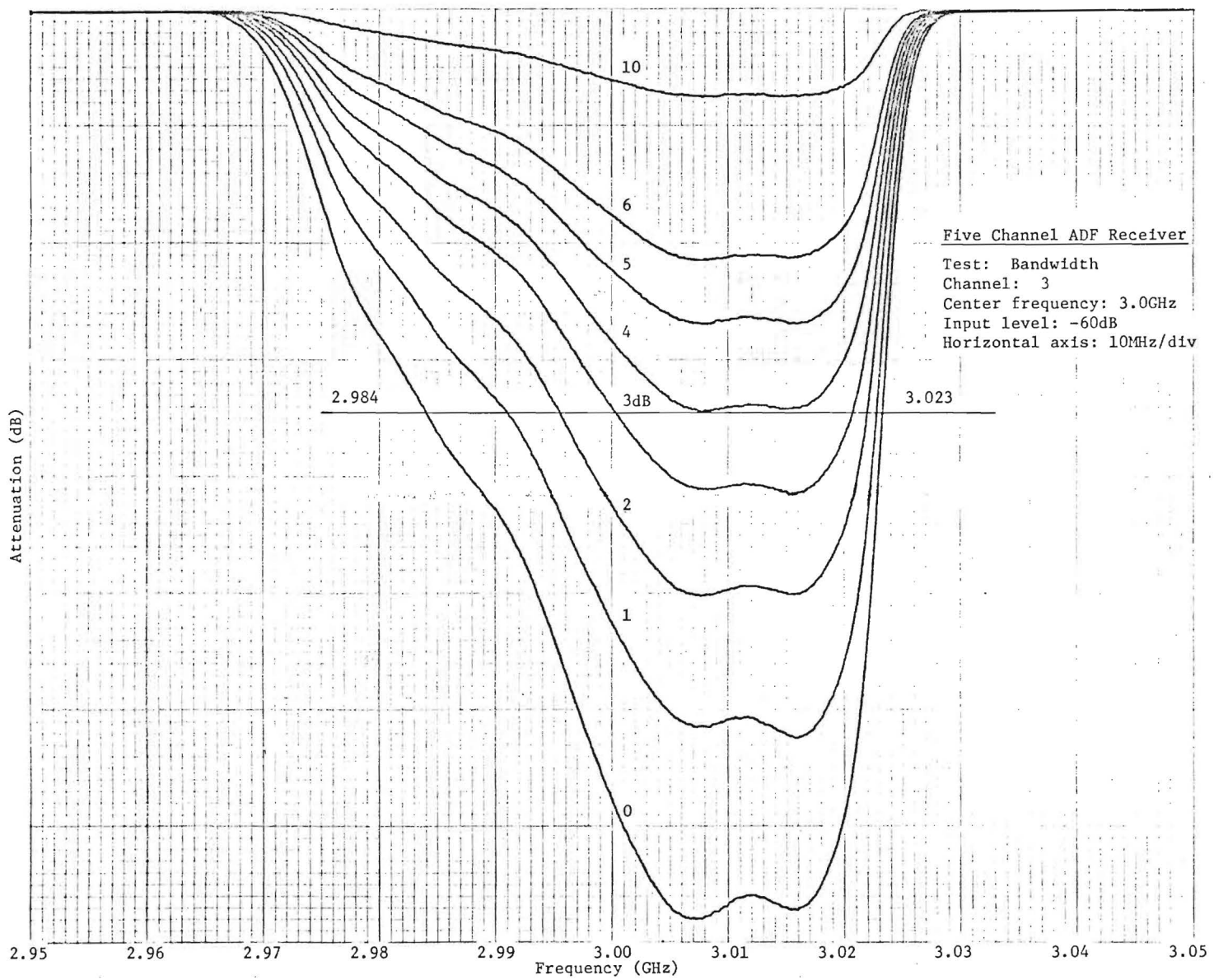
Frequency (GHz)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Channel: 3
Center frequency: 3.0GHz
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Horizontal axis: 10MHz/div
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6
5
4
3dB
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3.023
2
1
0
Attenuation (dB)
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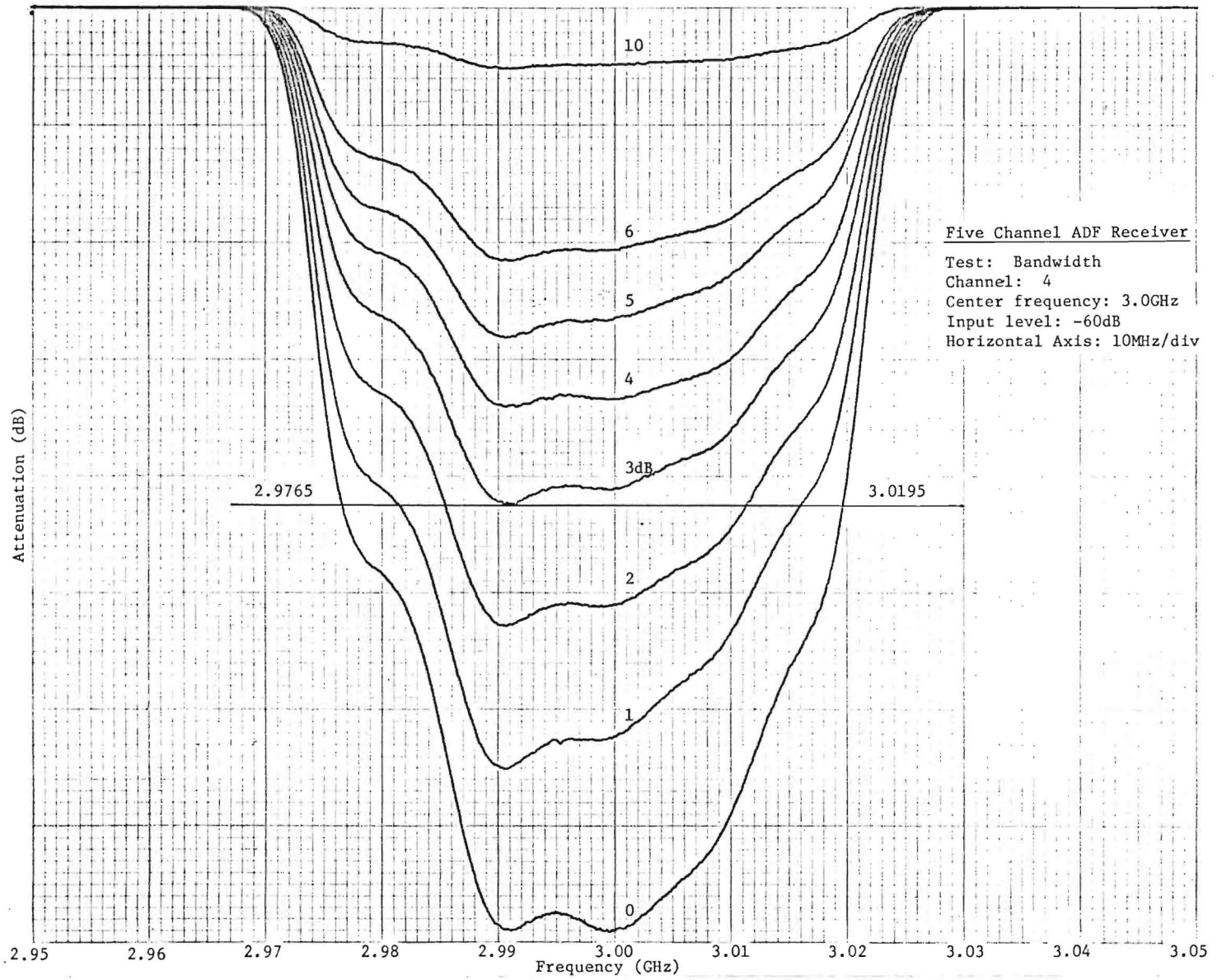
Frequency (GHz)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Horizontal Axis: 10MHz/div
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6
5
4
3dB
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3.0195
2
1
0
Attenuation (dB)
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2.99
3.00
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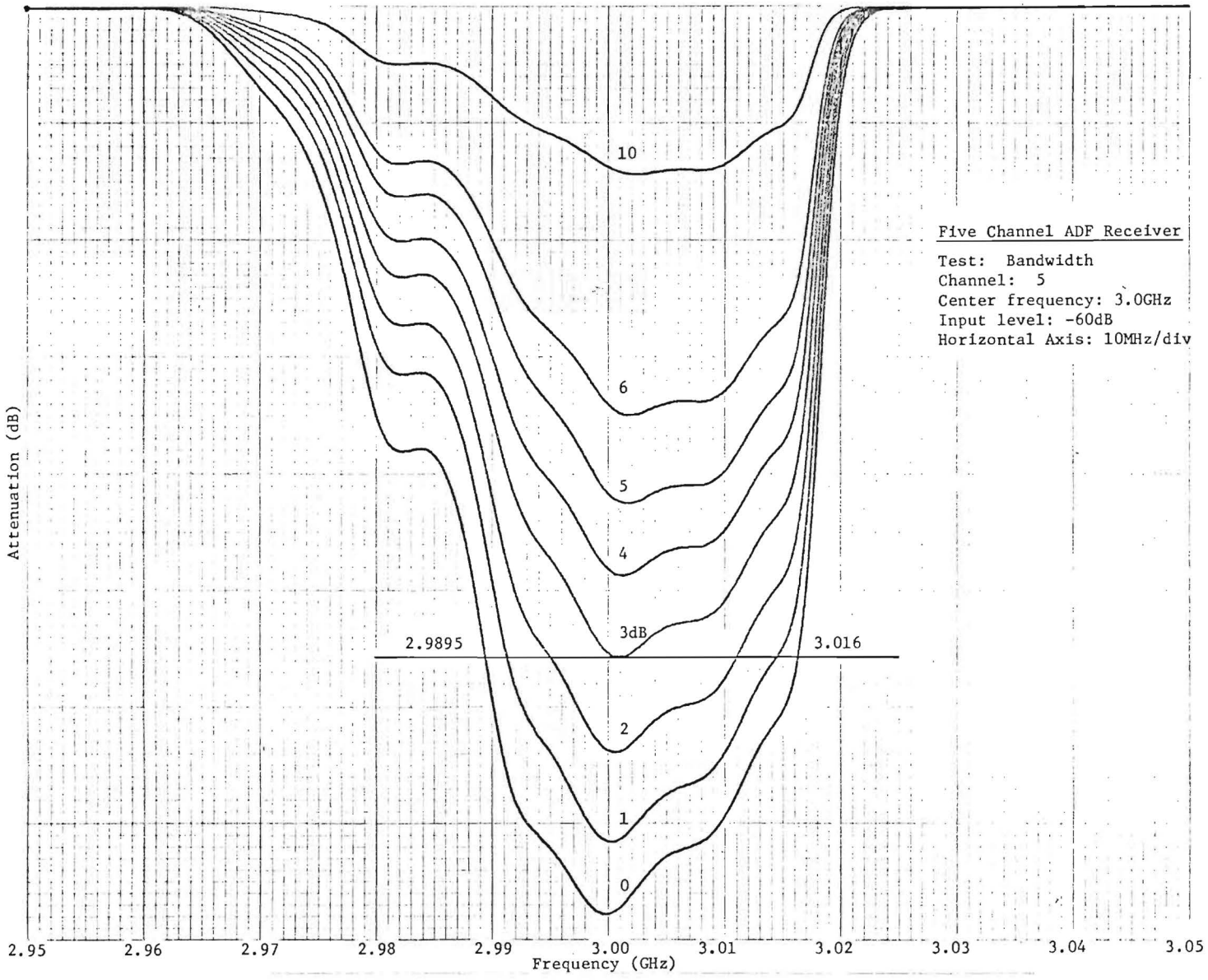
3.02
3.03
3.04
3.05
Frequency (GHz)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1
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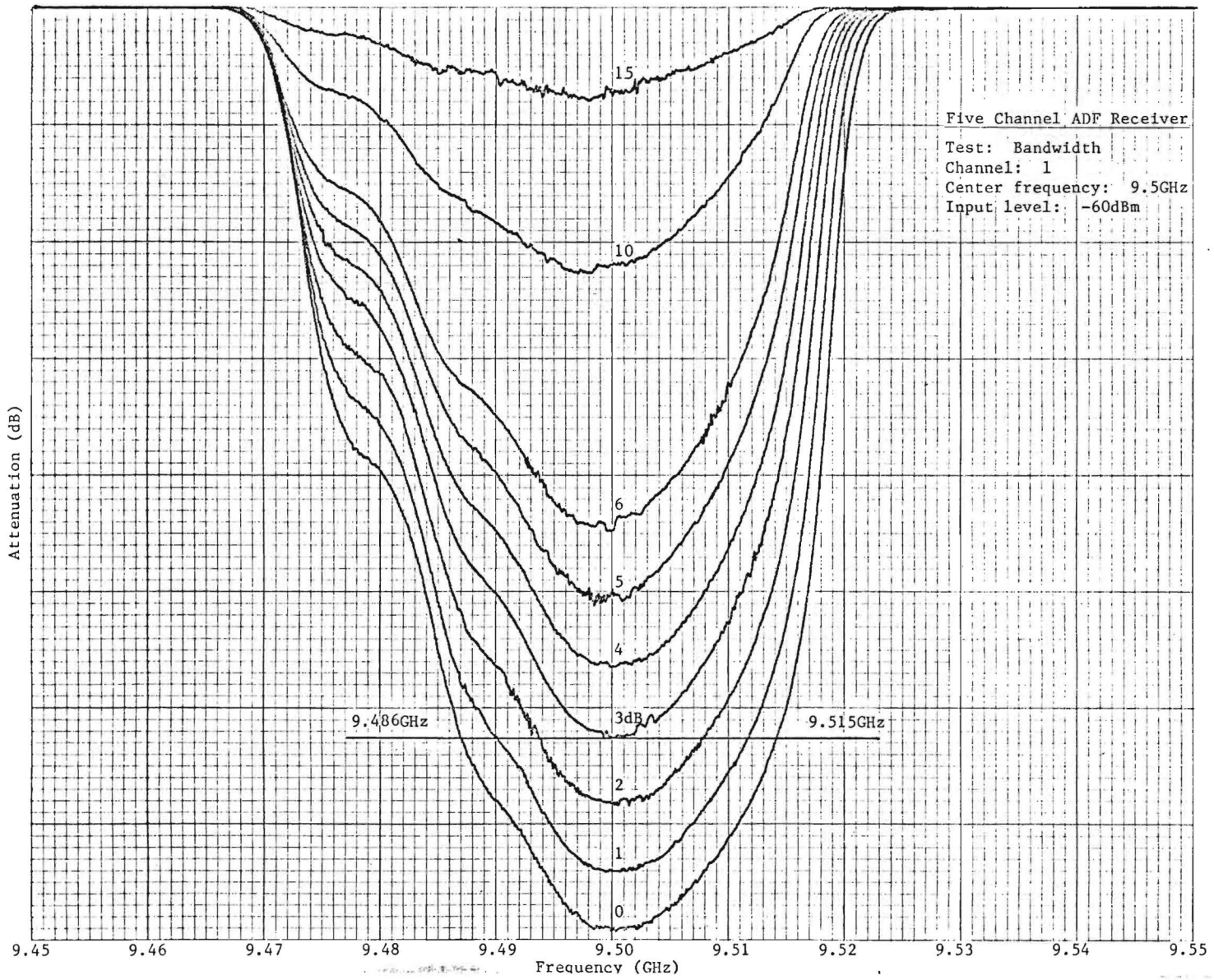
Frequency (GHz)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6
5
4
3dB
2
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9.486GHz
9.515GHz
Attenuation (dB)
9.45
9.46
9.47
9.48
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9.50
9.51
9.52
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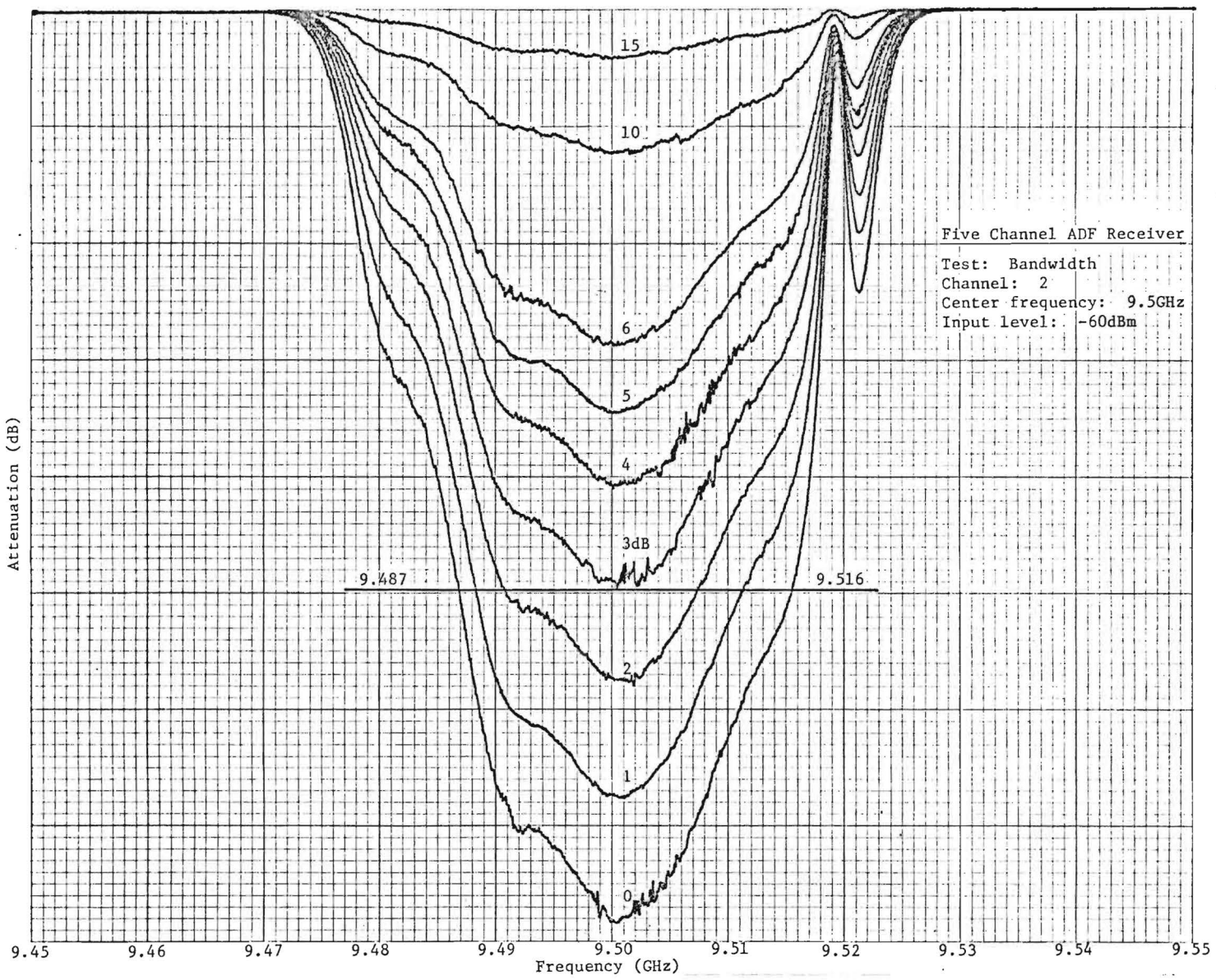
9.54
9.55
Frequency (GHz)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9.487
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Attenuation (dB)
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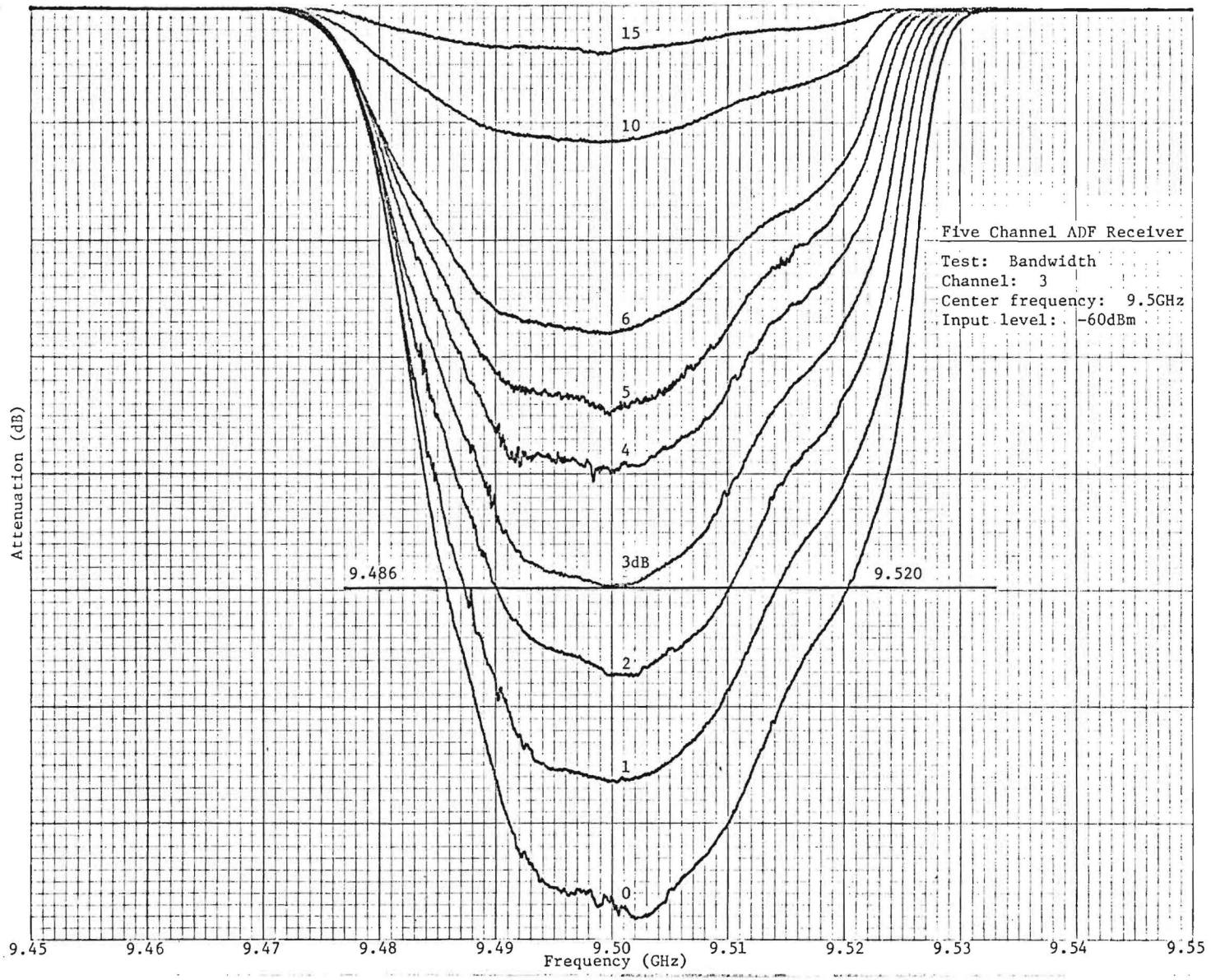
Frequency (GHz)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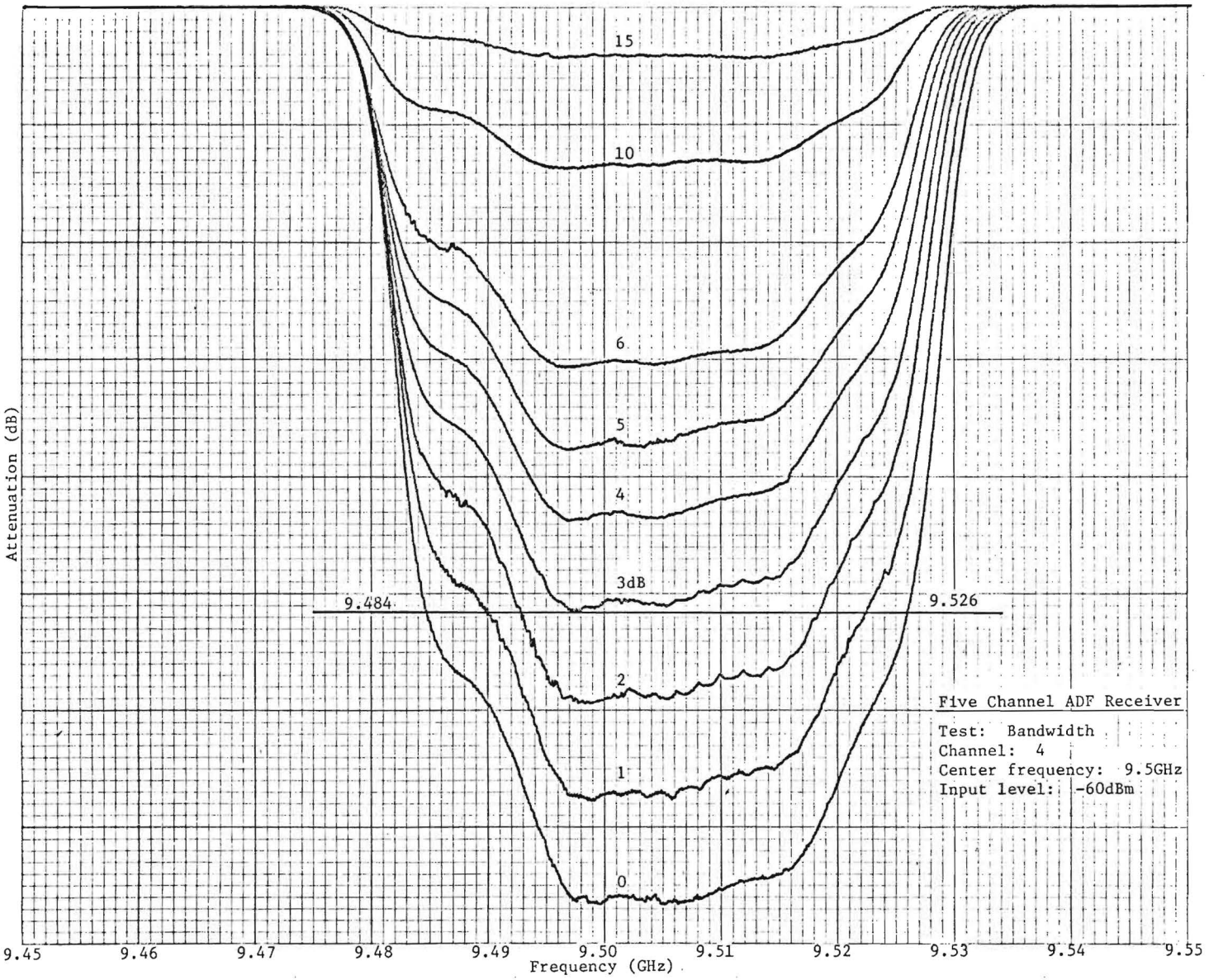
Frequency (GHz)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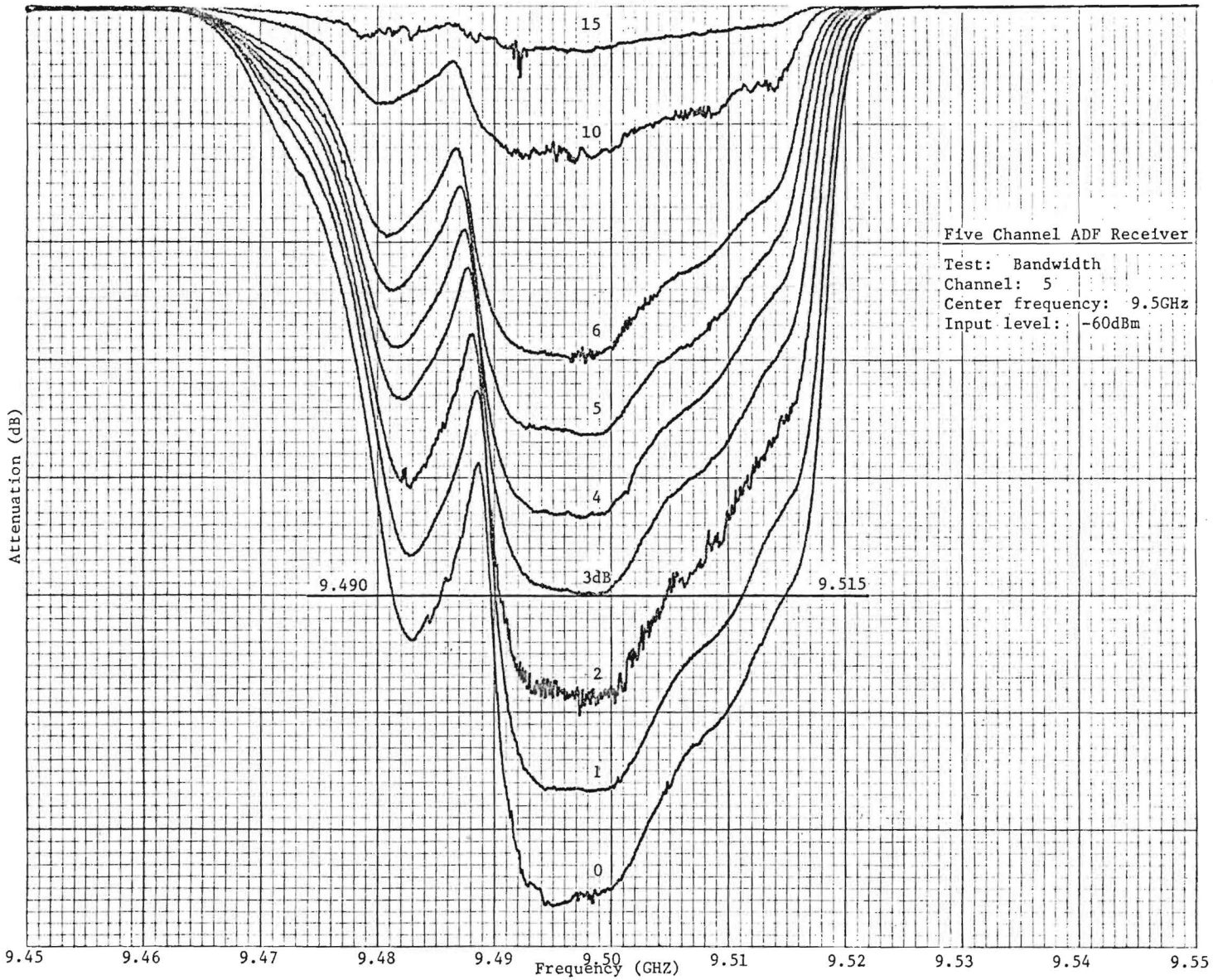
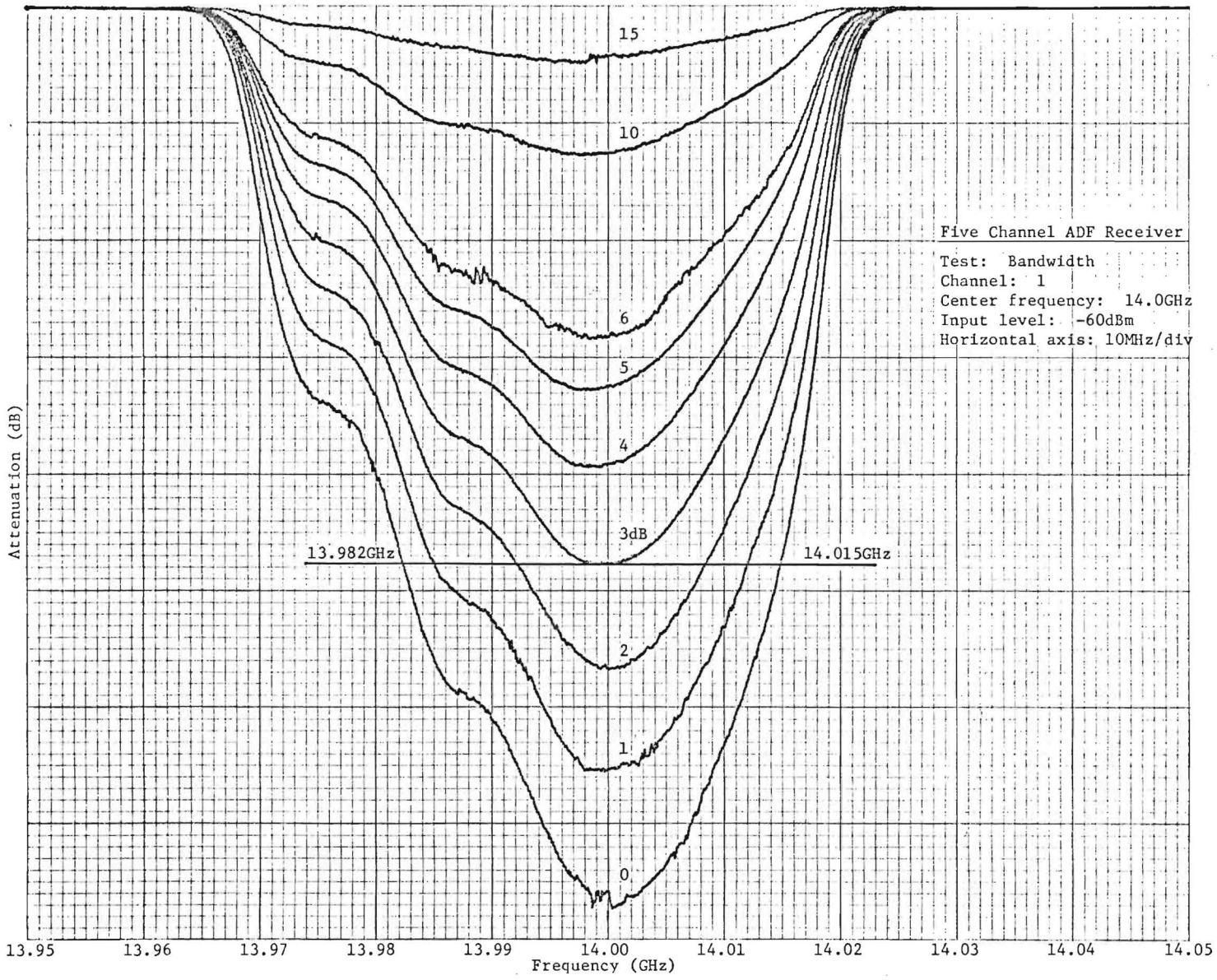
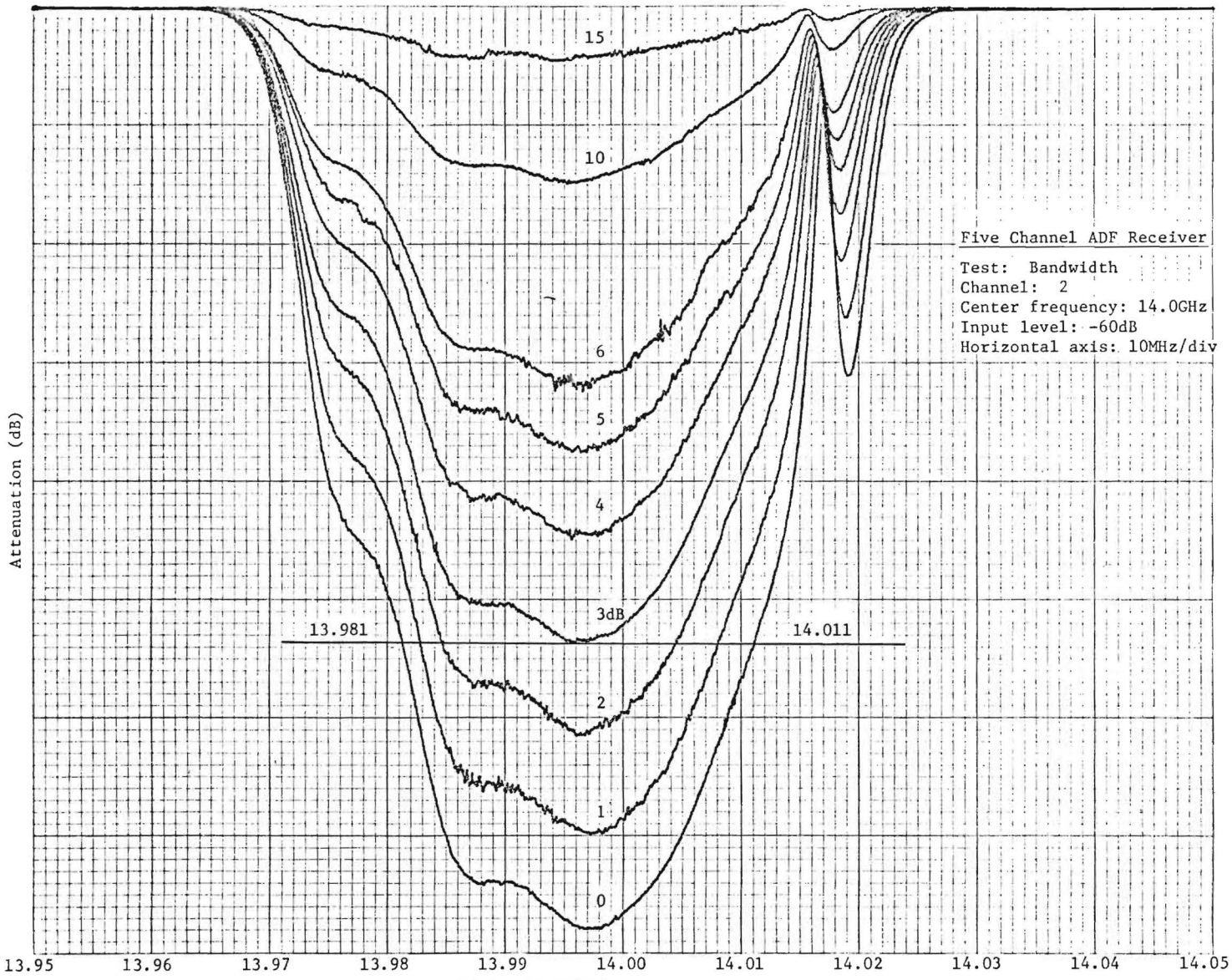
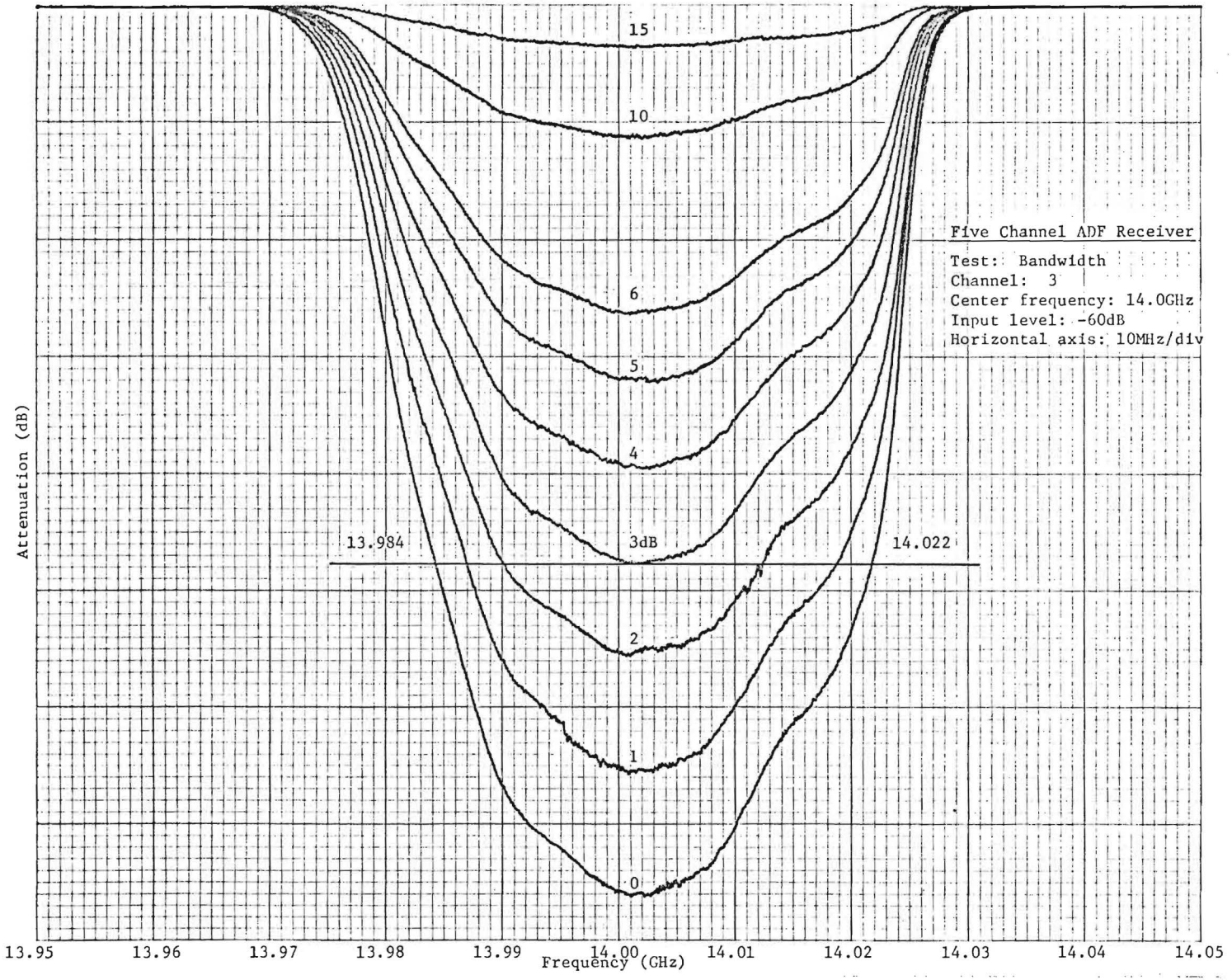
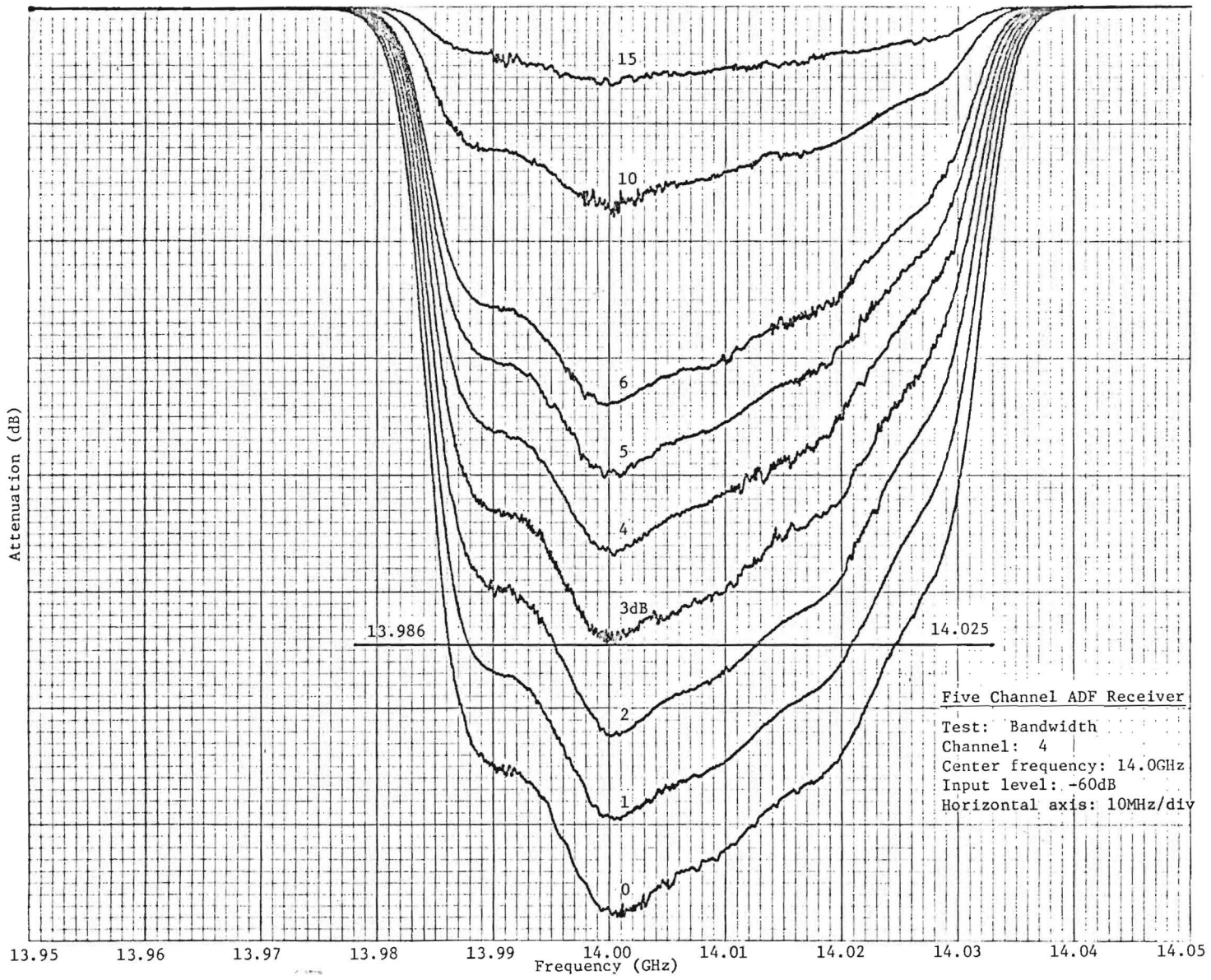
9.54
9.55
Frequency (GHz)
Five Channel ADF Receiver
Test: Bandwidth
Channel: 4
Center frequency: 9.5GHz
Input level: -60dBm

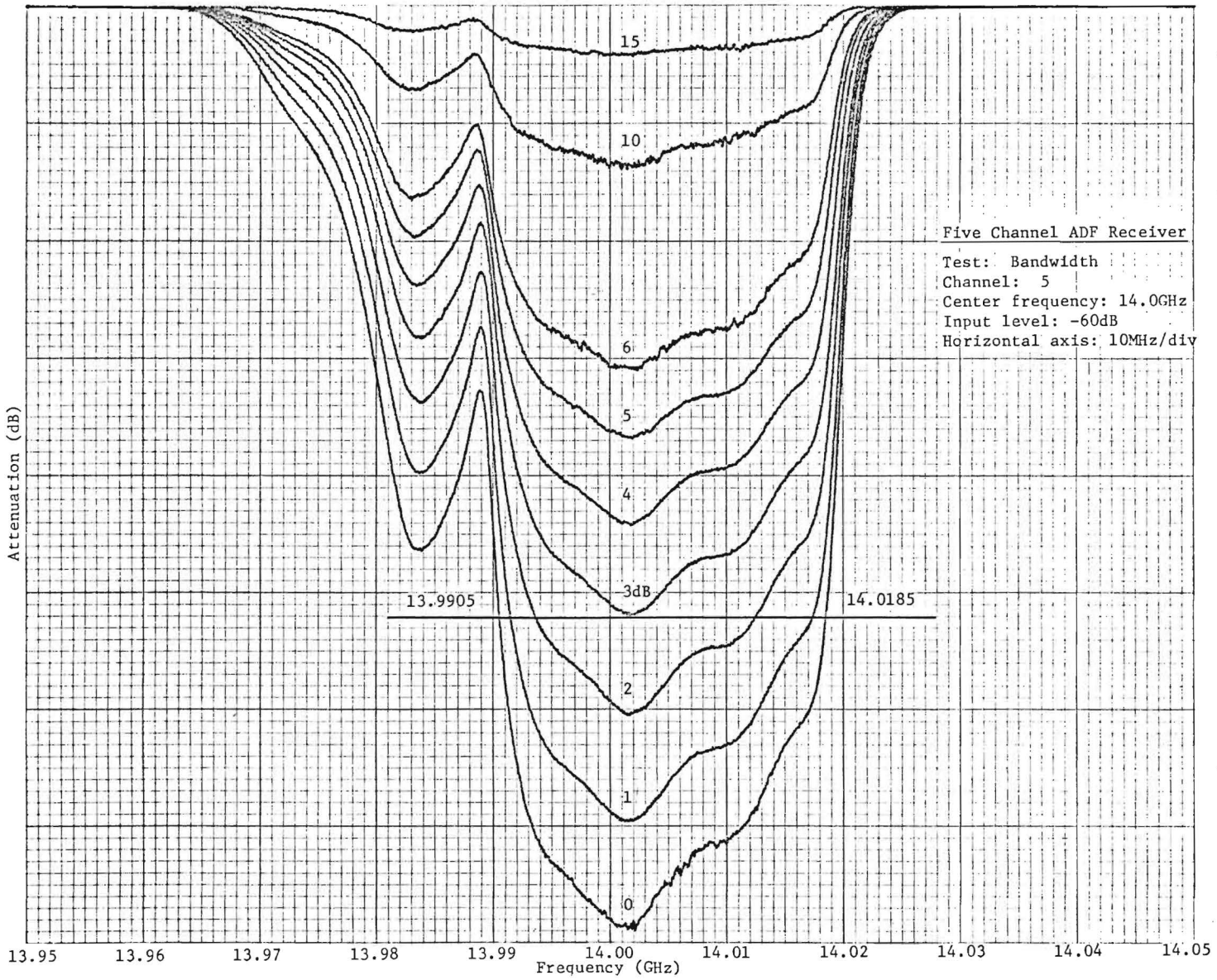

15
10
6
5
4
3dB
2
1
0
9.490
9.515
Five Channel ADF Receiver
Test: Bandwidth
Channel: 5
Center frequency: 9.5GHz
Input level: -60dBm
Attenuation (dB)
9.45
9.46
9.47
9.48
9.49
9.50
9.51
9.52
9.53
9.54
9.55
Frequency (GHZ)

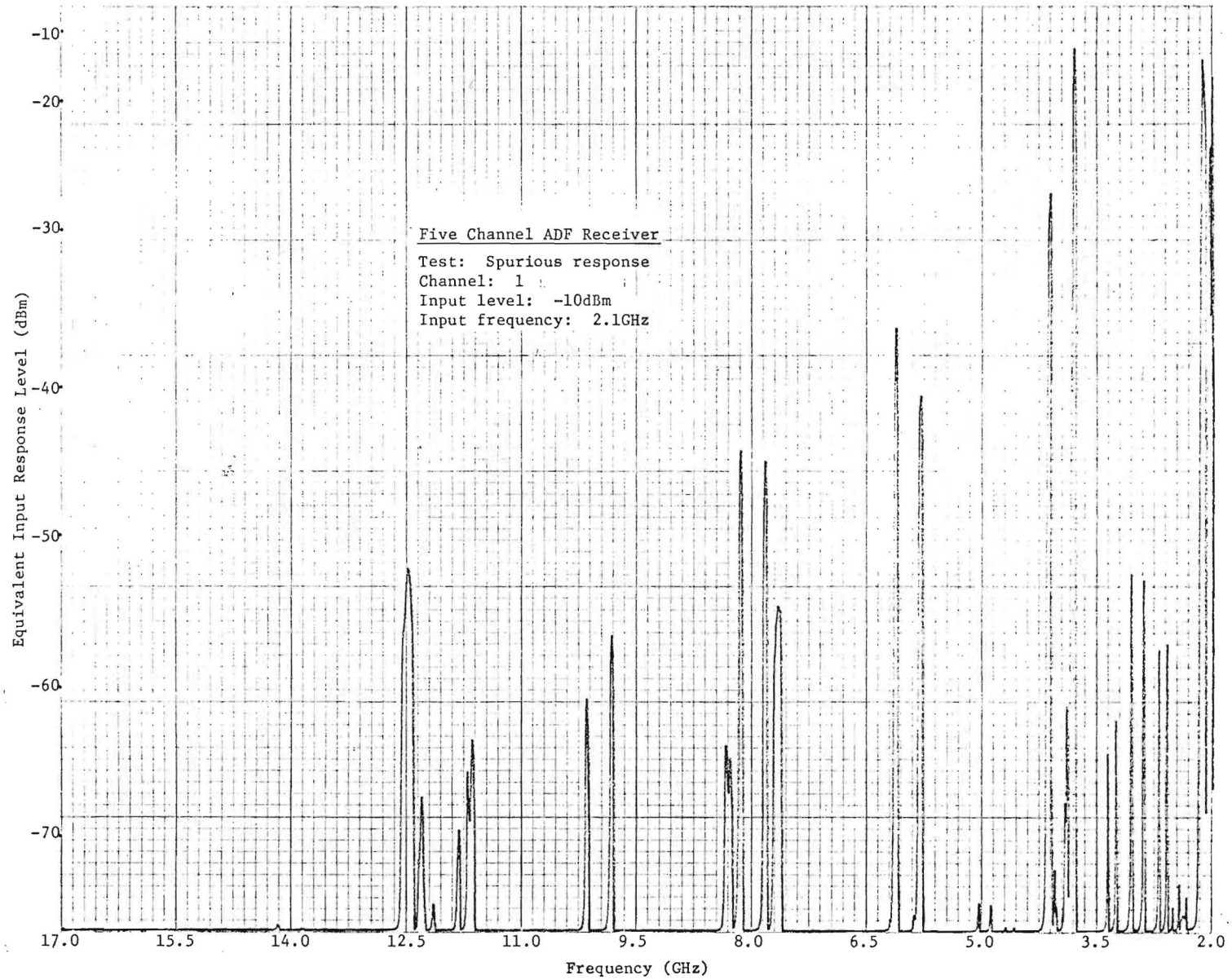

15
10
6
5
4
3dB
2
1
0
13.982GHz
14.015GHz
Five Channel ADF Receiver
Test: Bandwidth
Channel: 1
Center frequency: 14.0GHz
Input level: -60dBm
Horizontal axis: 10MHz/div
Attenuation (dB)
13.95
13.96
13.97
13.98
13.99
14.00
14.01
14.02
14.03
14.04
14.05
Frequency (GHz)

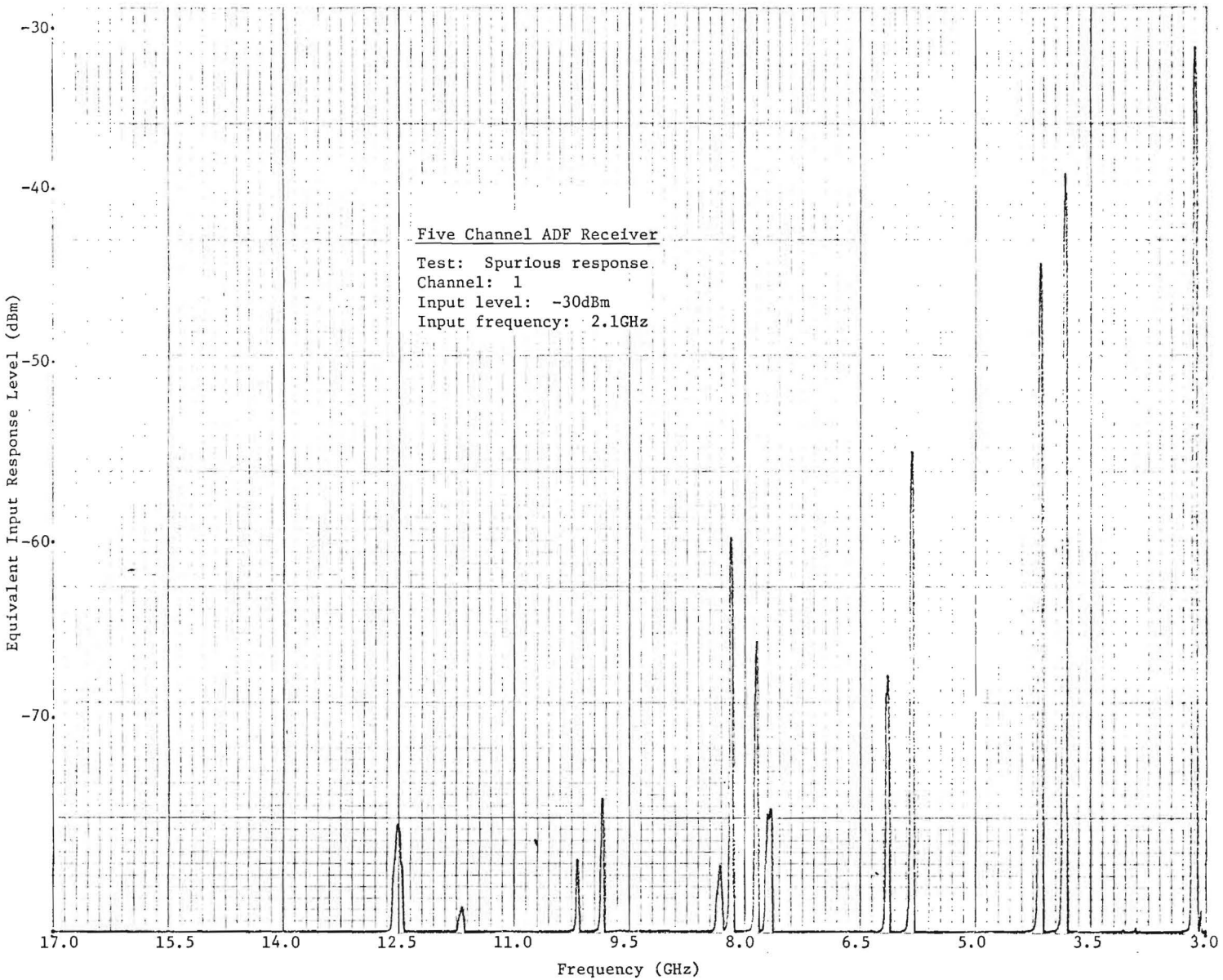

15
10
6
5
4
3dB
2
1
0
13.981
14.011
Attenuation (dB)
13.95
13.96
13.97
13.98
13.99
14.00
14.01
14.02
14.03
14.04
14.05
Five Channel ADF Receiver
Test: Bandwidth
Channel: 2
Center frequency: 14.0GHz
Input level: -60dB
Horizontal axis: 10MHz/div

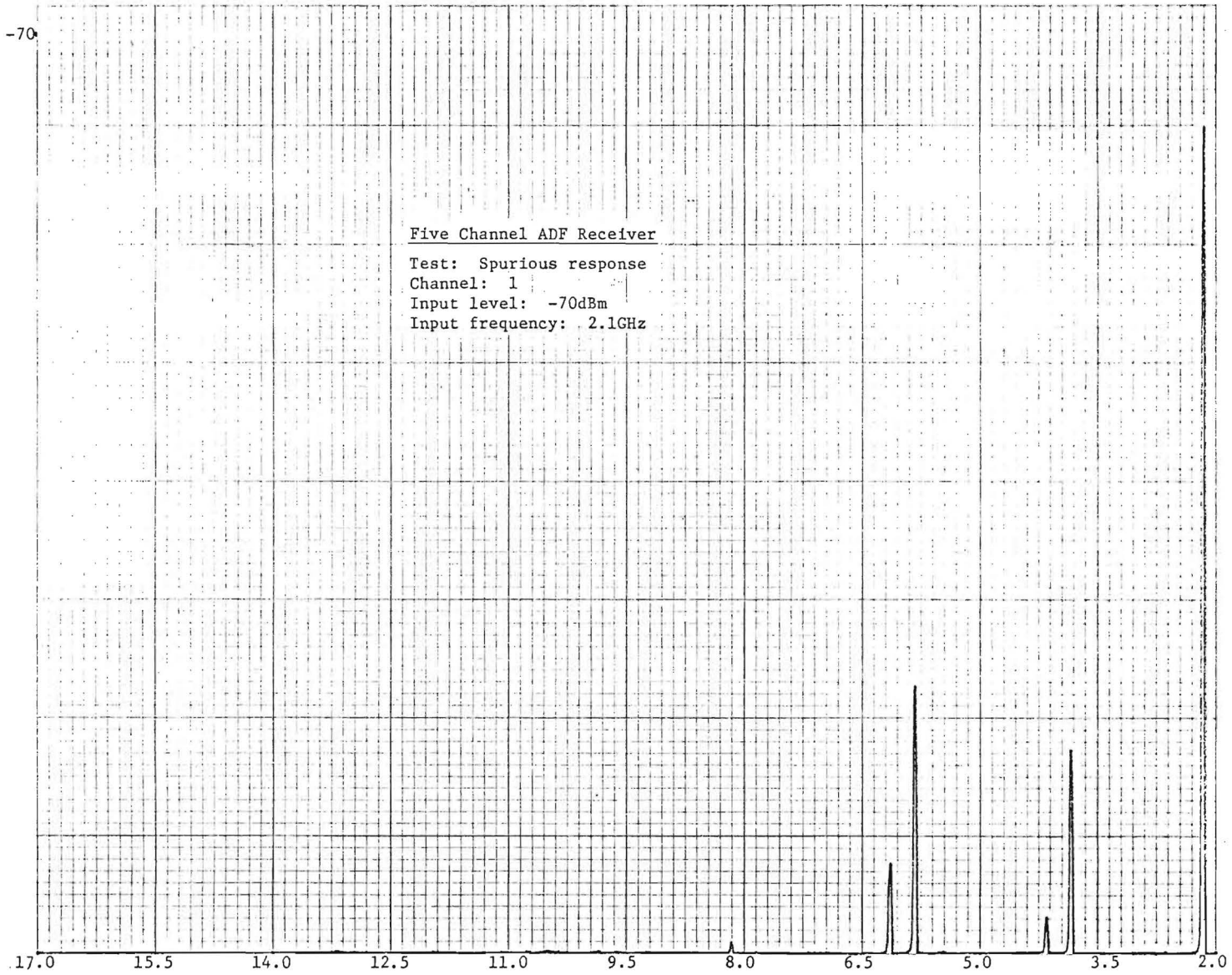

15
10
6
5
4
3dB
2
1
0
13.984
14.022
Five Channel ADF Receiver
Test: Bandwidth
Channel: 3
Center frequency: 14.0GHz
Input level: -60dB
Horizontal axis: 10MHz/div
Attenuation (dB)
13.95
13.96
13.97
13.98
13.99
14.00
14.01
14.02
14.03
14.04
14.05
Frequency (GHz)

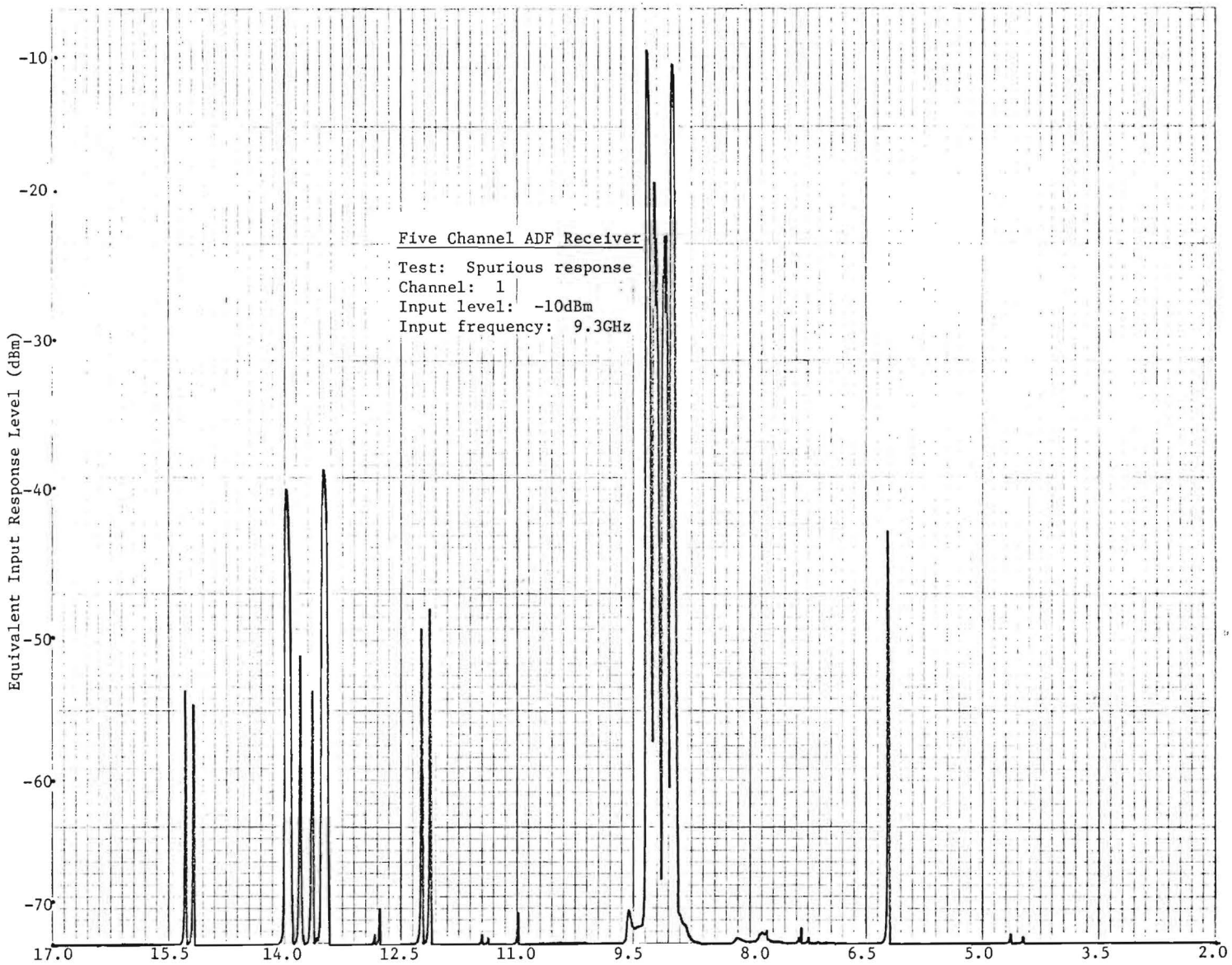

15
10
6
5
4
3dB
2
1
0
13.986
14.025
Attenuation (dB)
13.95
13.96
13.97
13.98
13.99
14.00
14.01
14.02
14.03
14.04
14.05
Frequency (GHz)
Five Channel ADF Receiver
Test: Bandwidth
Channel: 4
Center frequency: 14.0GHz
Input level: -60dB
Horizontal axis: 10MHz/div

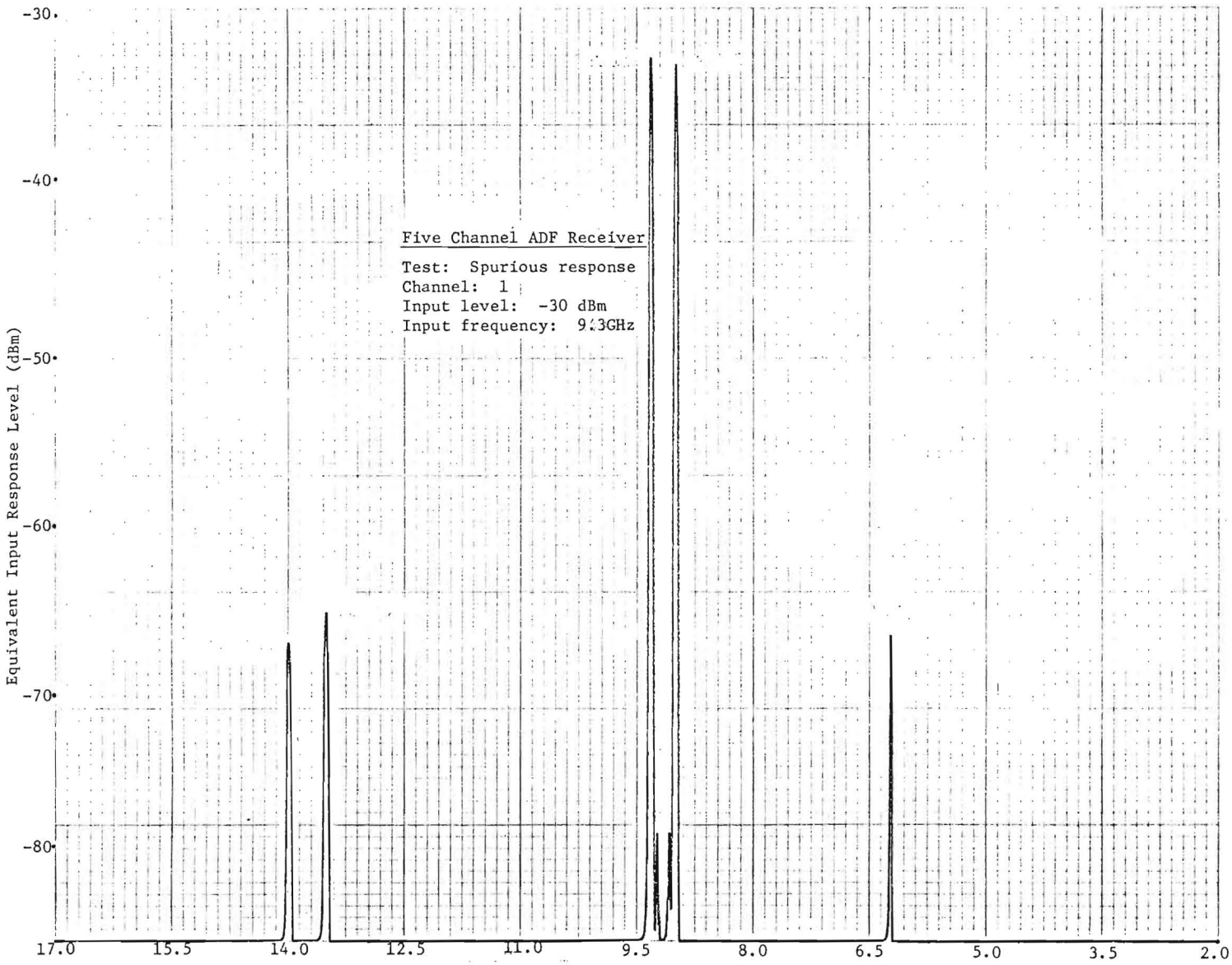

15
10
6
5
4
3dB
2
1
0
13.9905
14.0185
Five Channel ADF Receiver
Test: Bandwidth
Channel: 5
Center frequency: 14.0GHz
Input level: -60dB
Horizontal axis: 10MHz/div
Attenuation (dB)
13.95
13.96
13.97
13.98
13.99
14.00
14.01
14.02
14.03
14.04
14.05
Frequency (GHz)

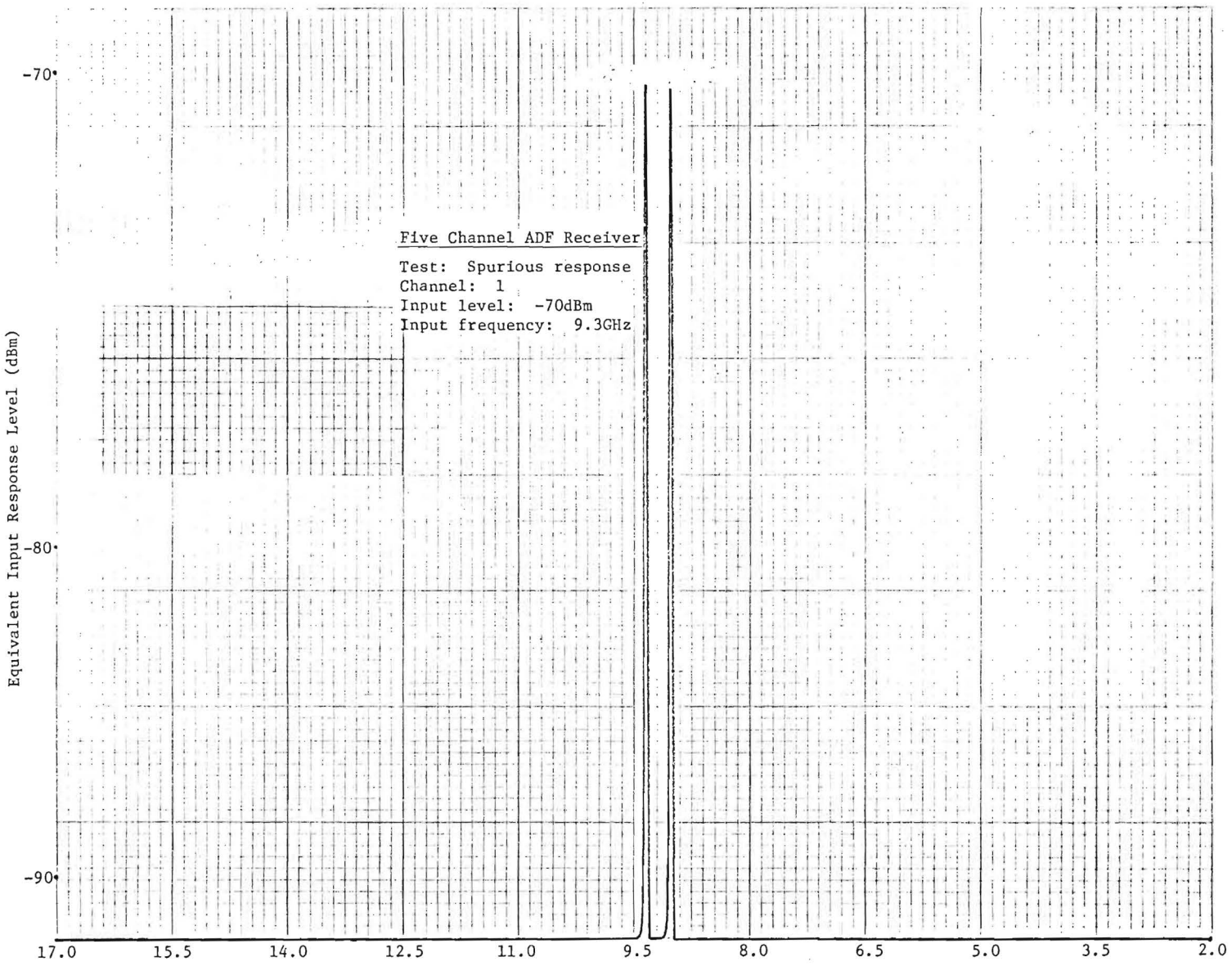

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -10dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

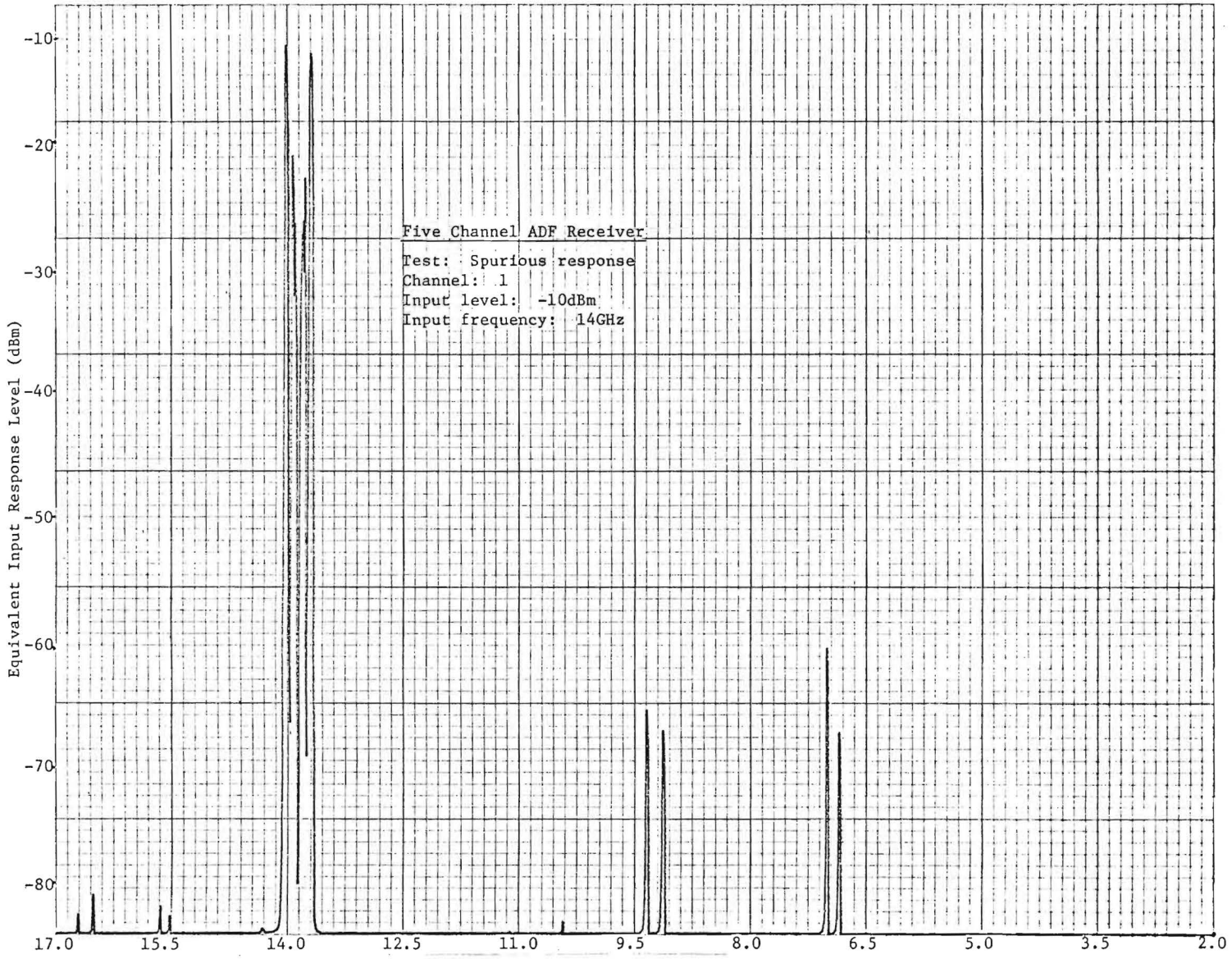

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -30dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
3.0
Frequency (GHz)

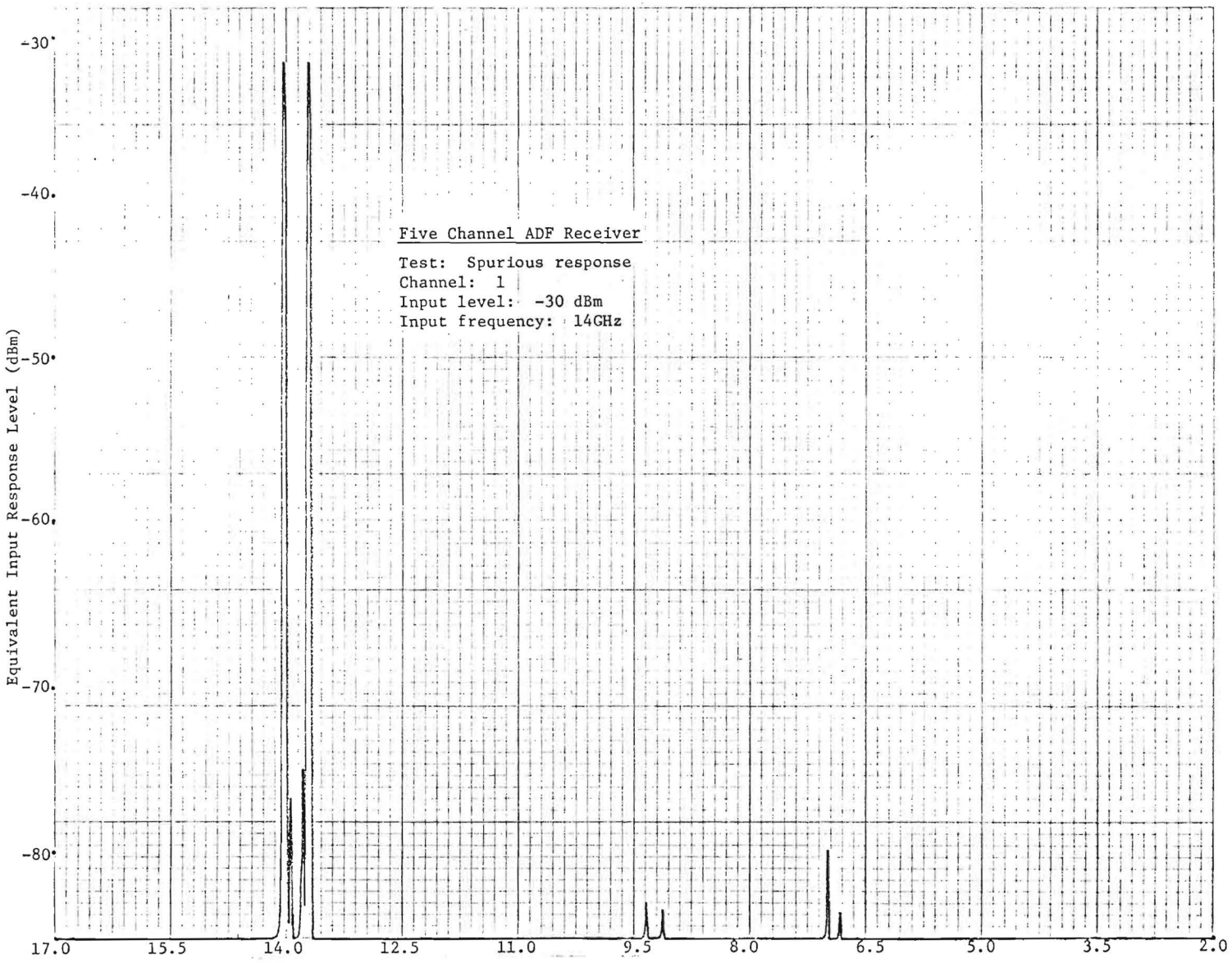

-70
Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -70dBm
Input frequency: 2.1GHz
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

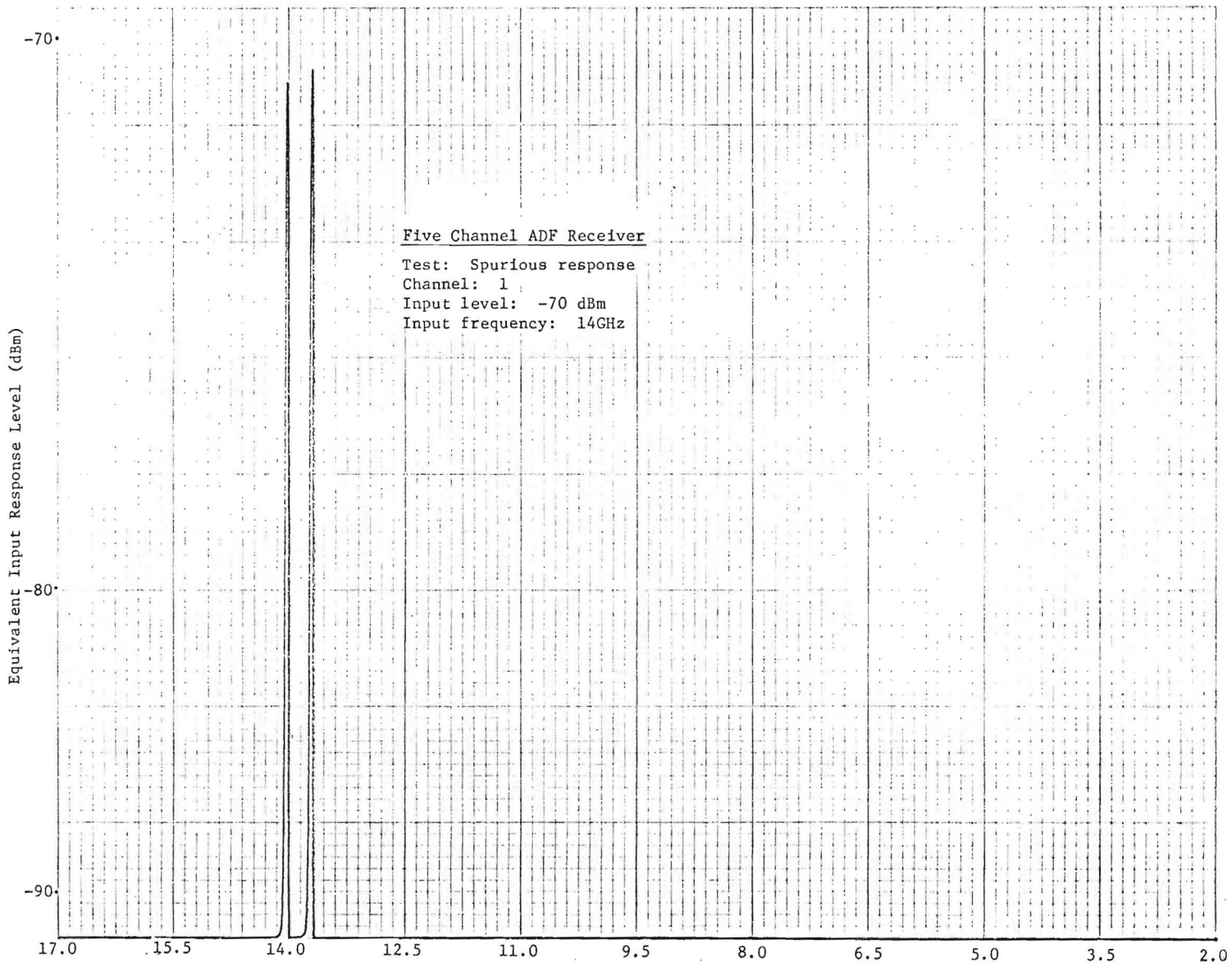

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -10dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

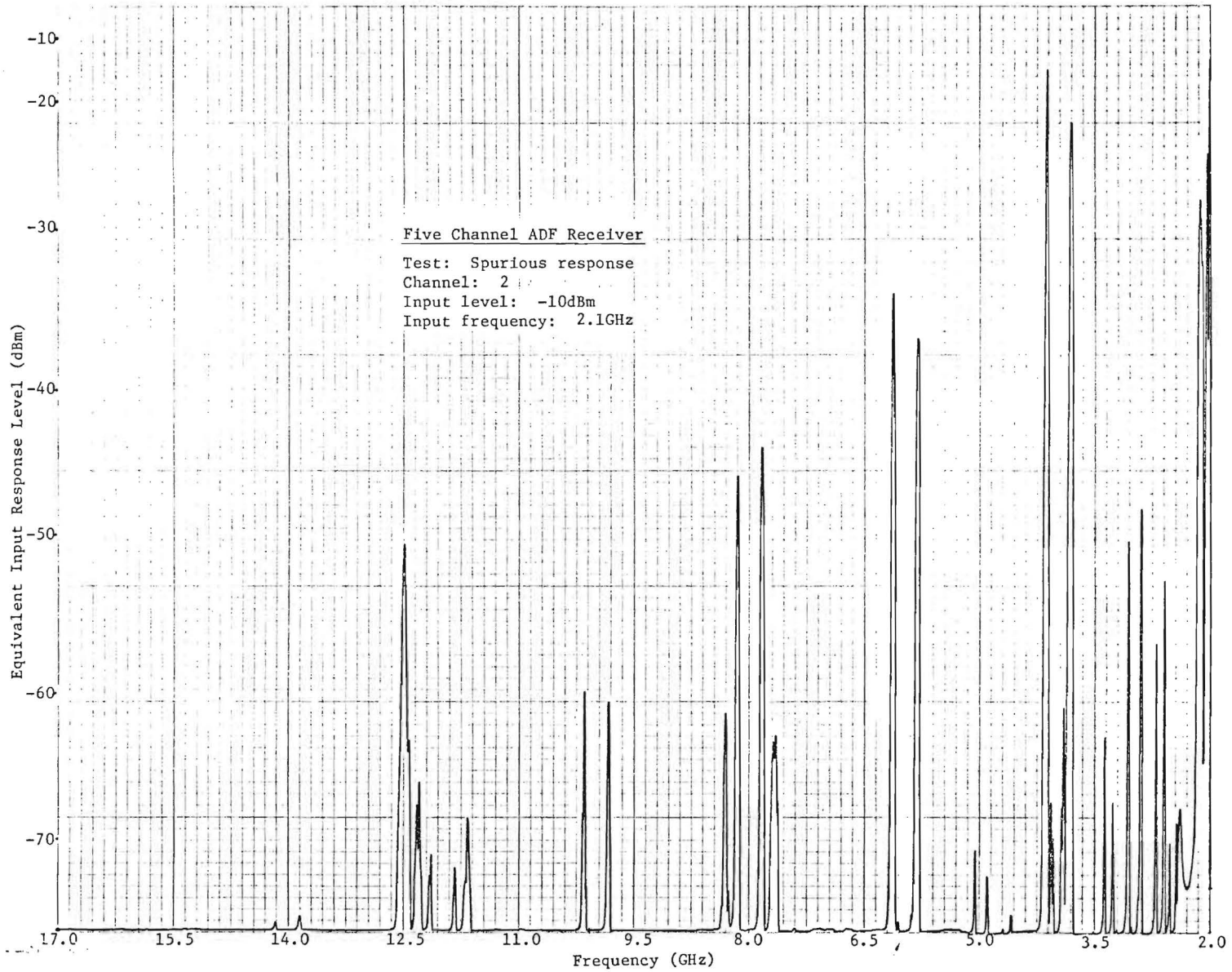

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -30 dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

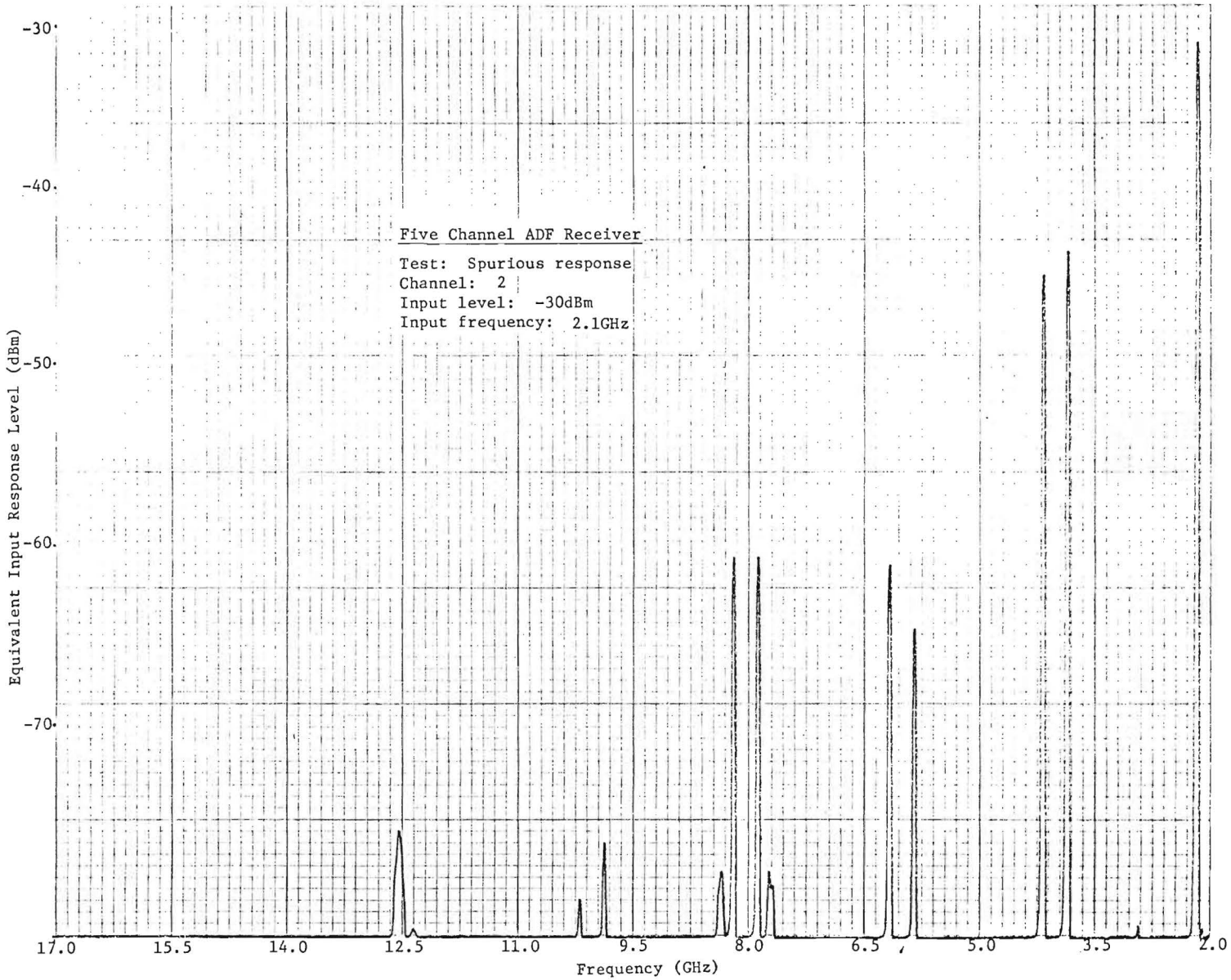

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -70dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-70
-80
-90
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

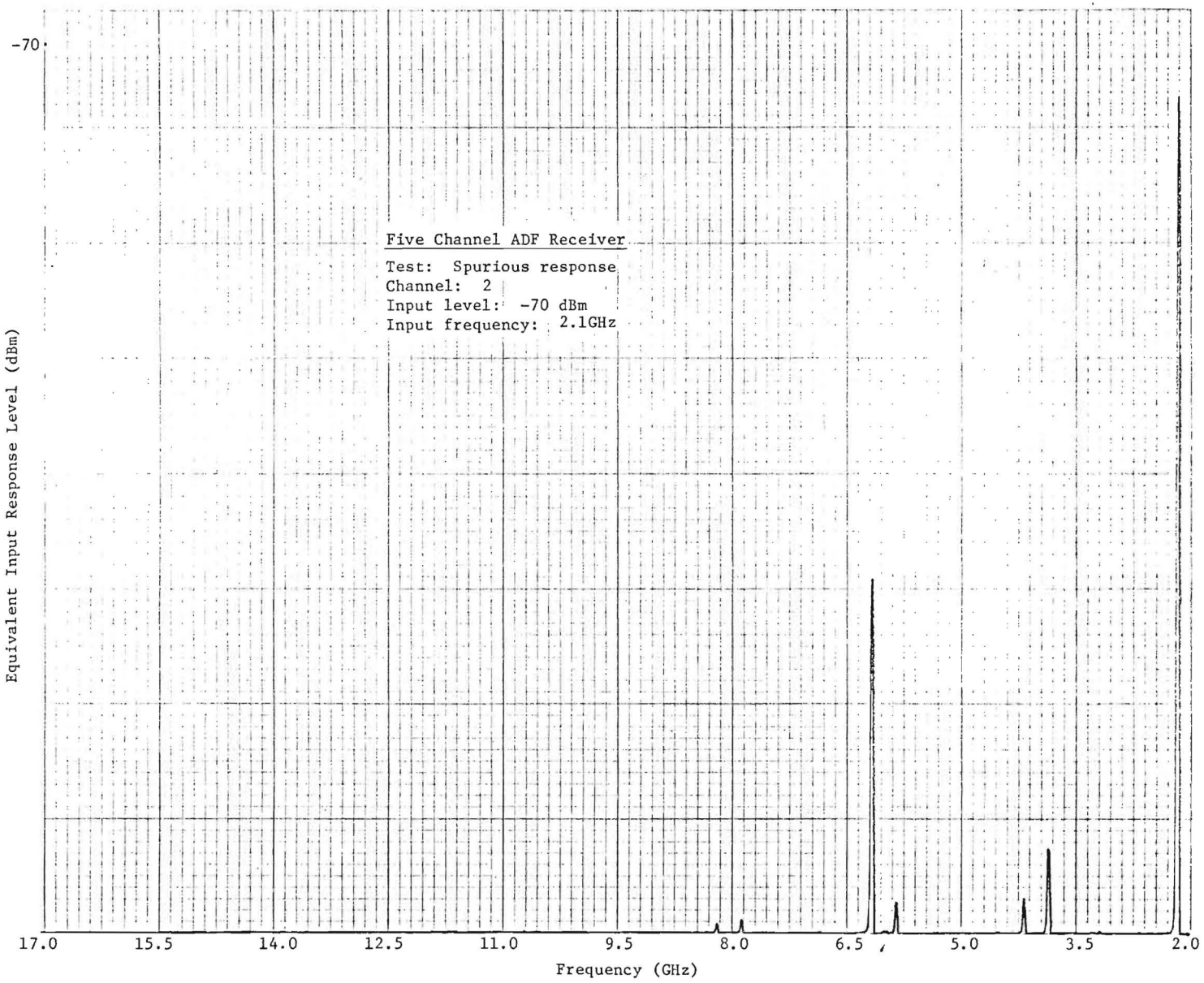

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -10dBm
Input frequency: 14GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

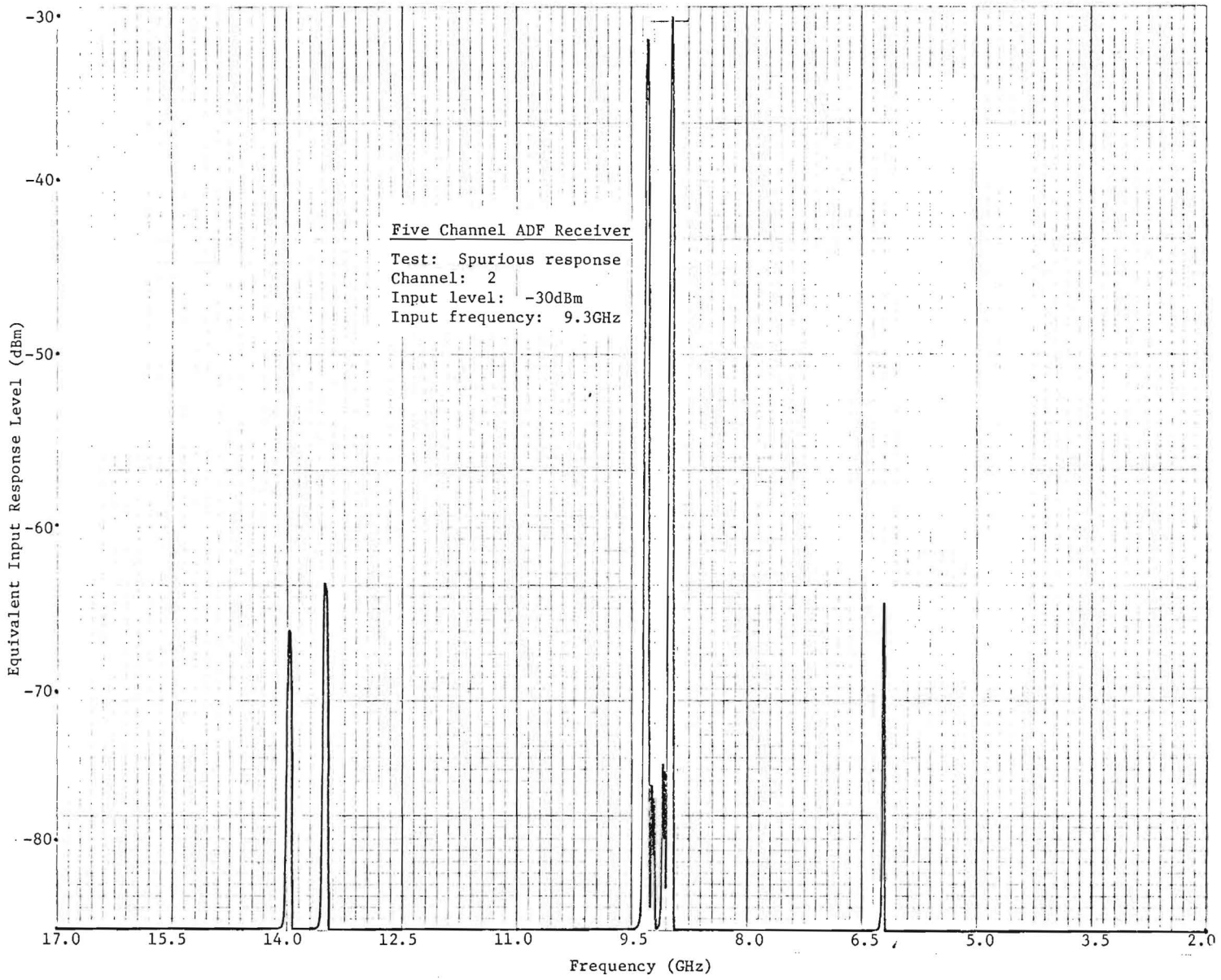

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -30 dBm
Input frequency: 14GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

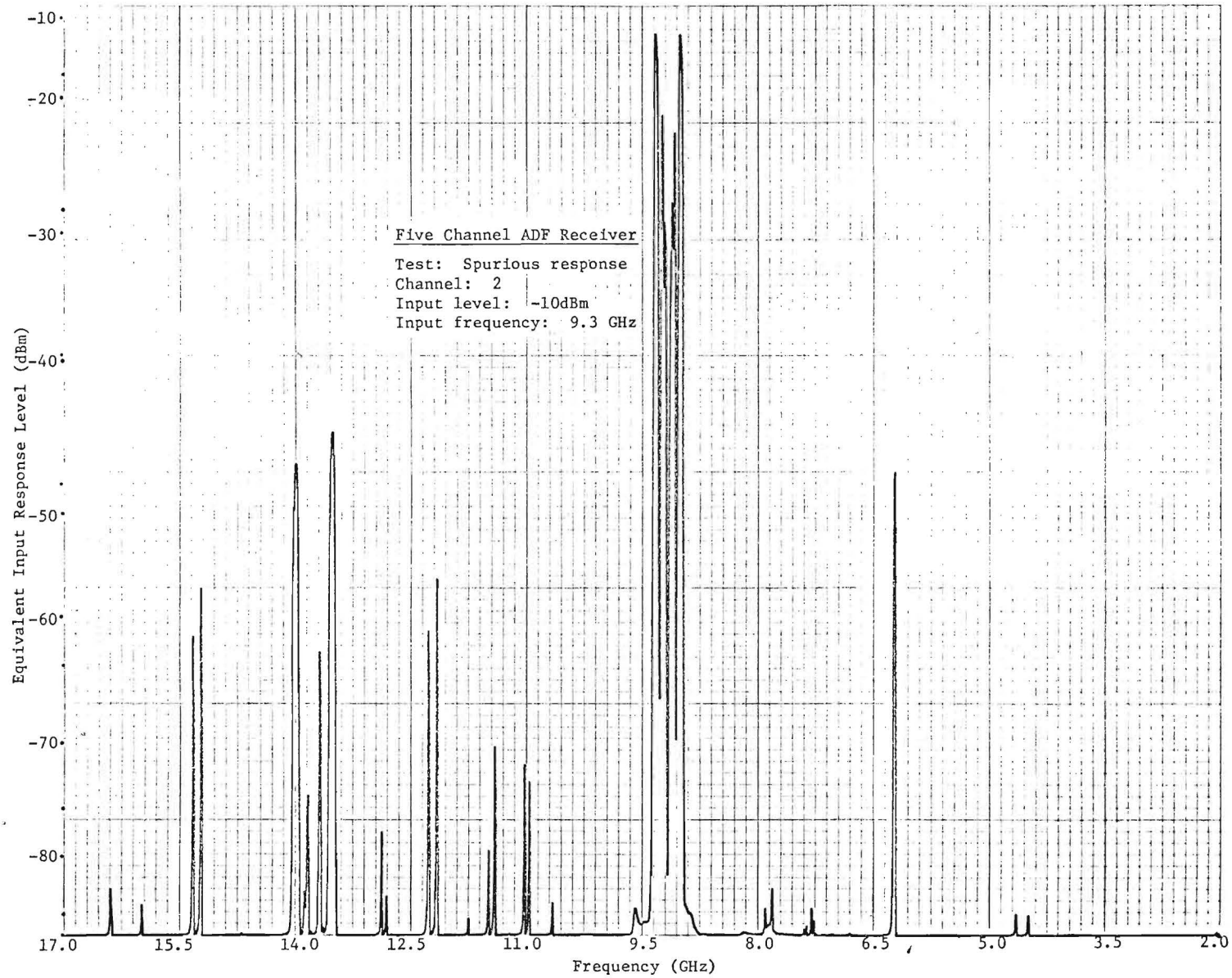

Five Channel ADF Receiver
Test: Spurious response
Channel: 1
Input level: -70 dBm
Input frequency: 14GHz
Equivalent Input Response Level (dBm)
-70
-80
-90
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

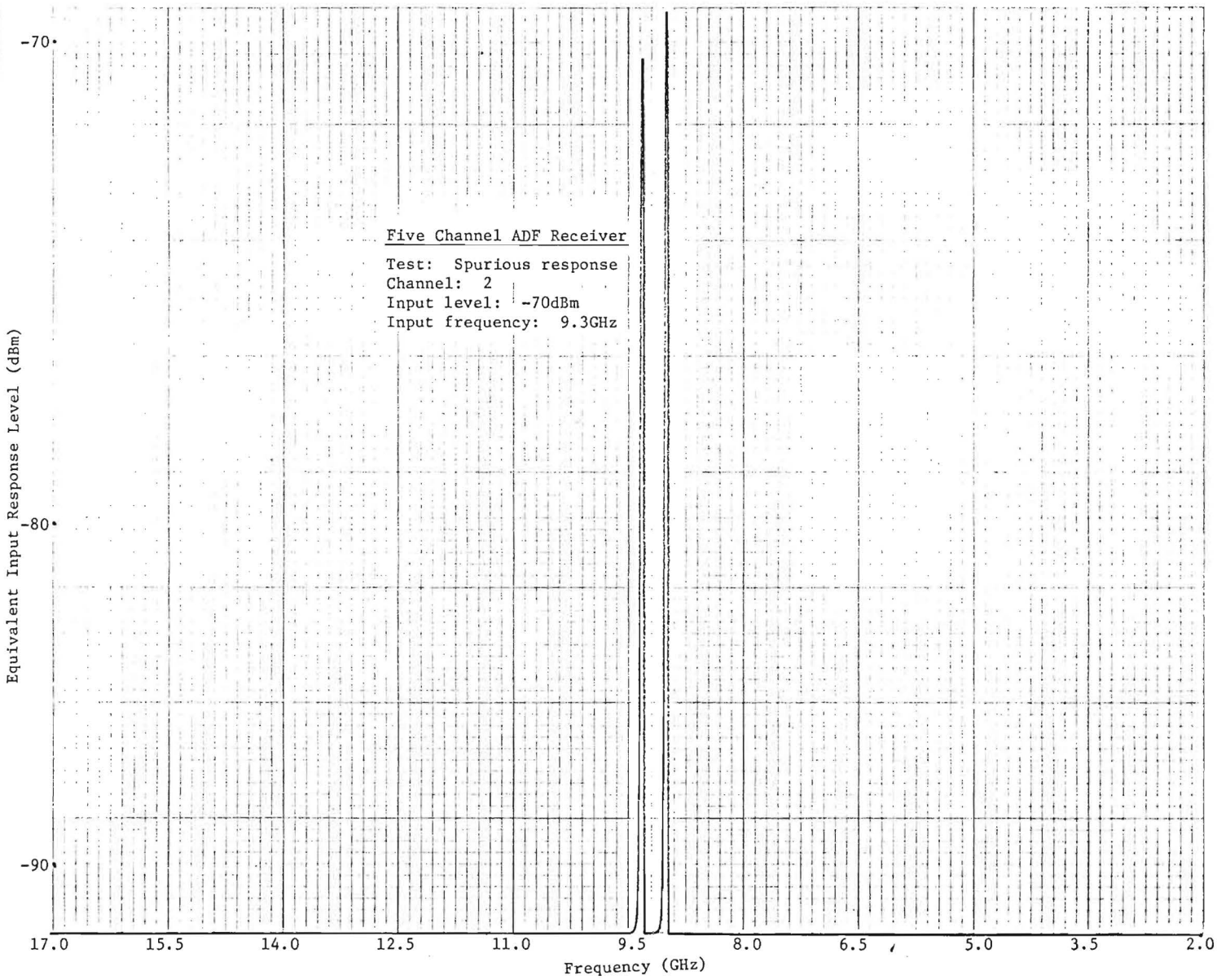

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -10dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

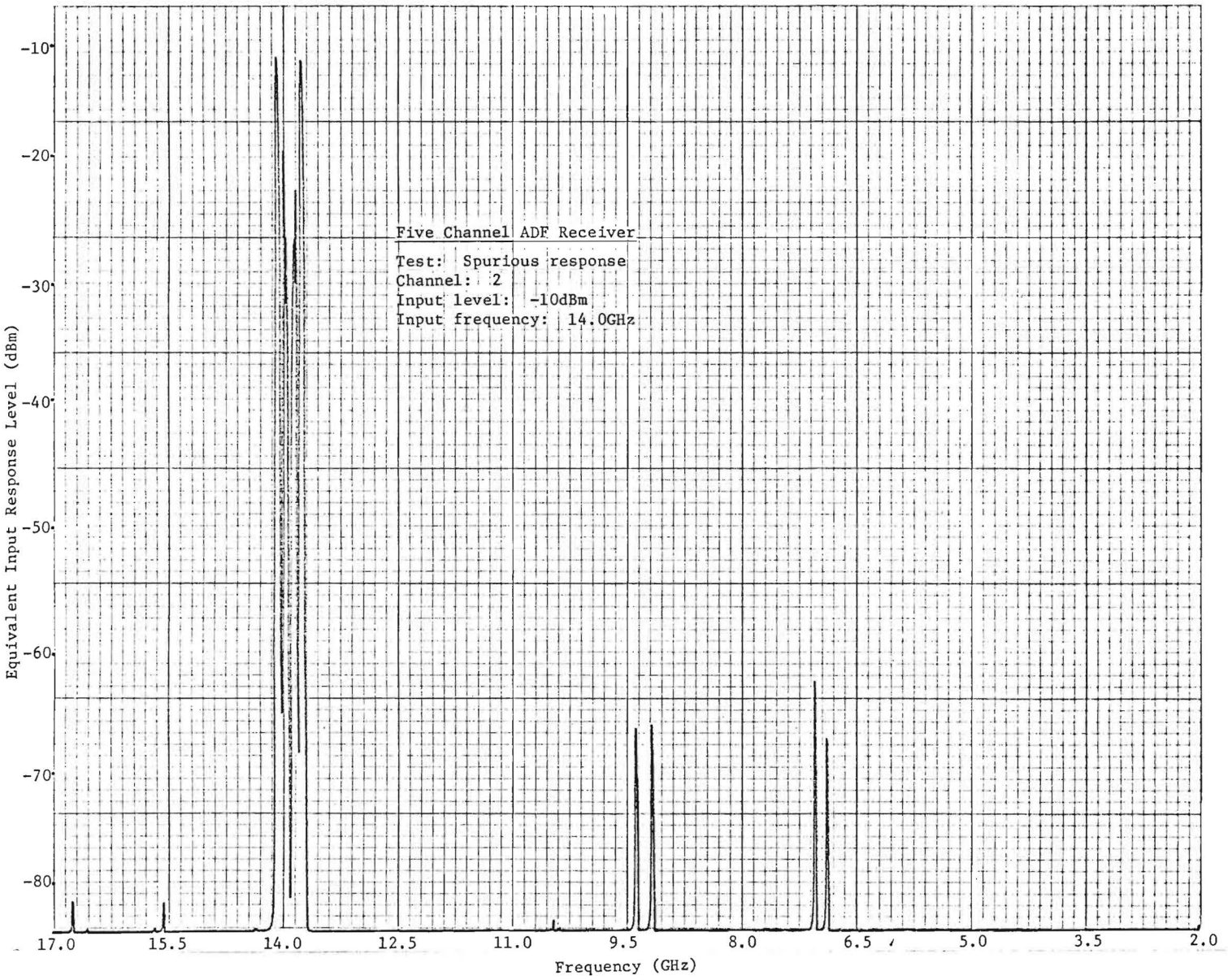

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -30dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

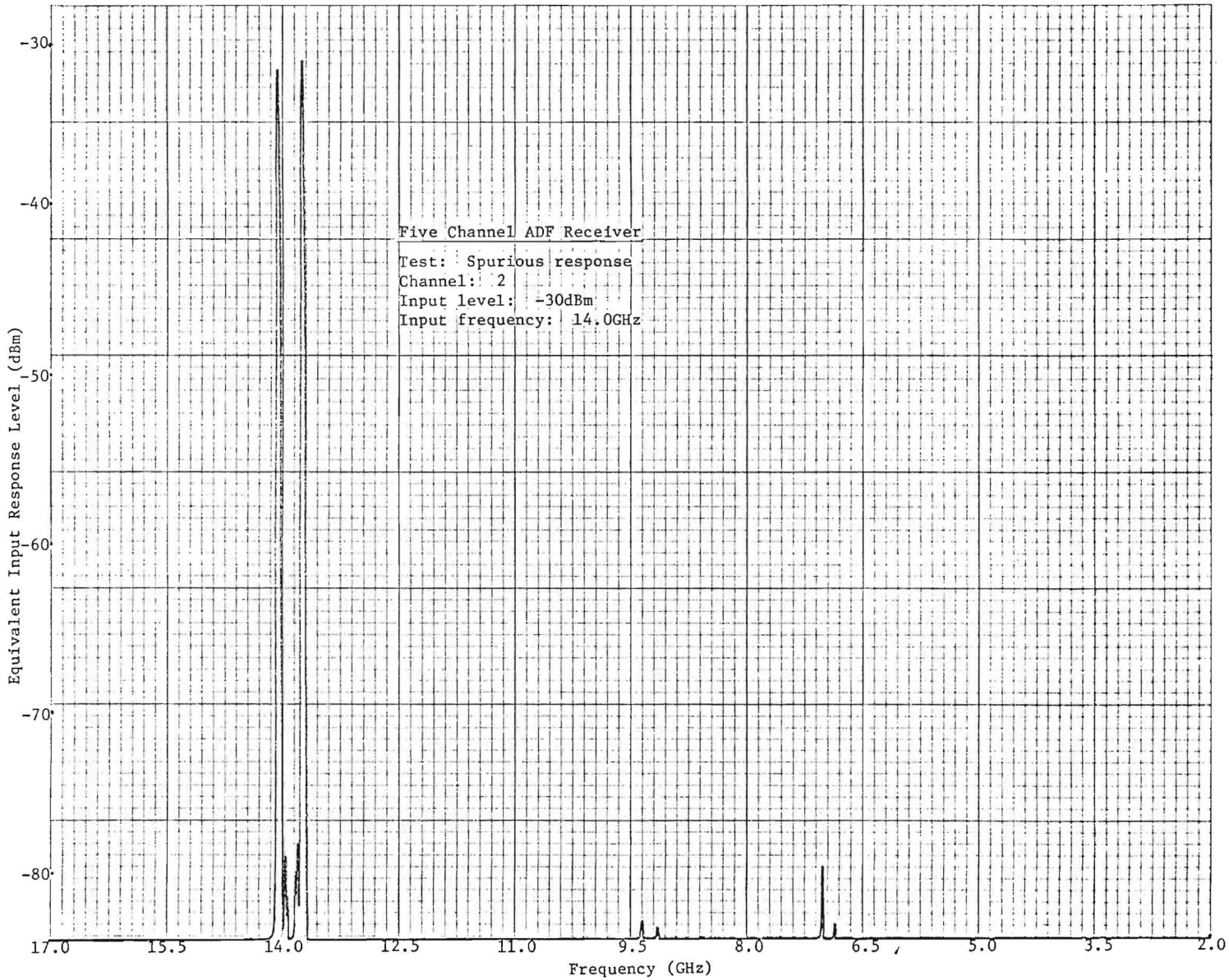

-70
Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -70 dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

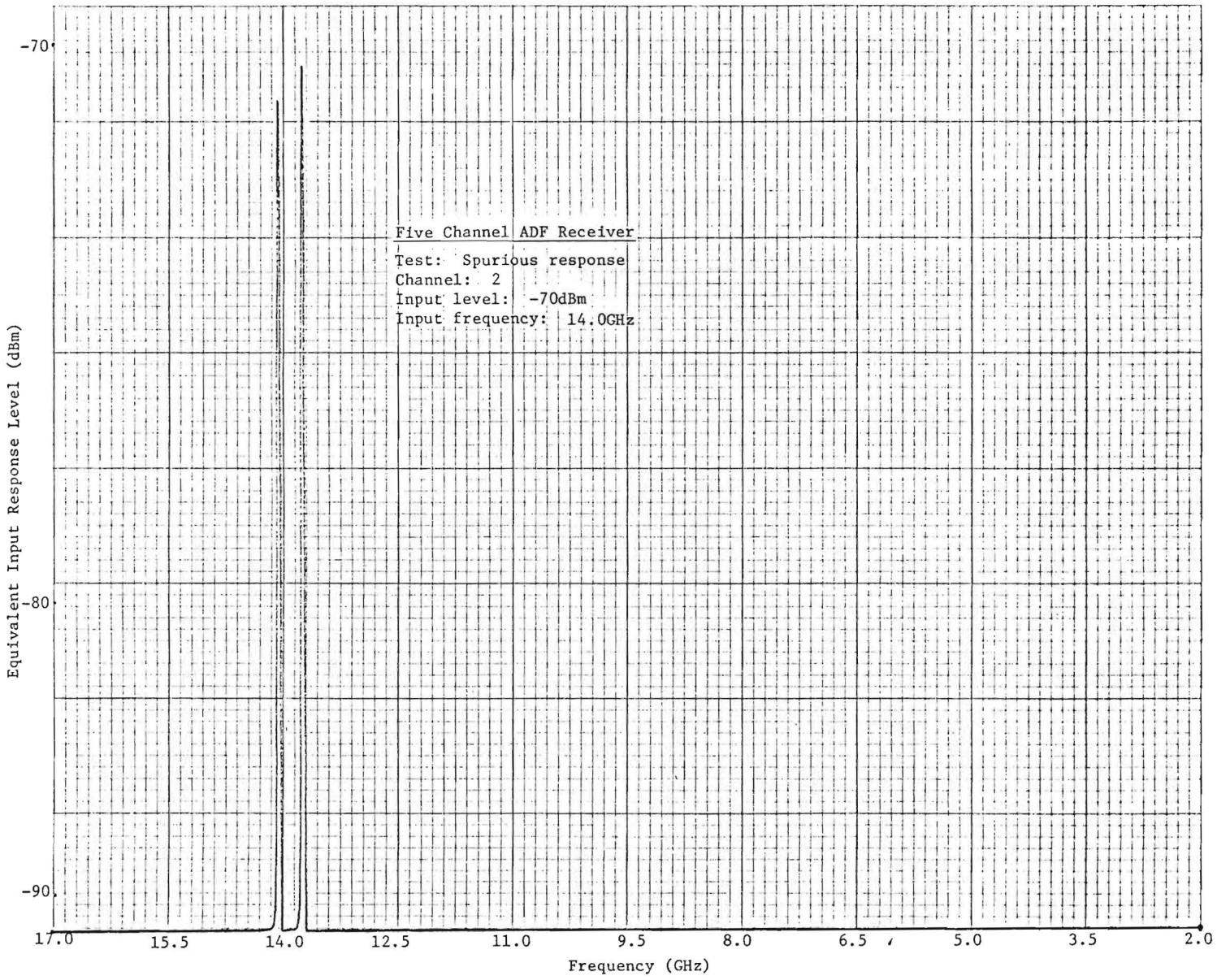

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -30dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

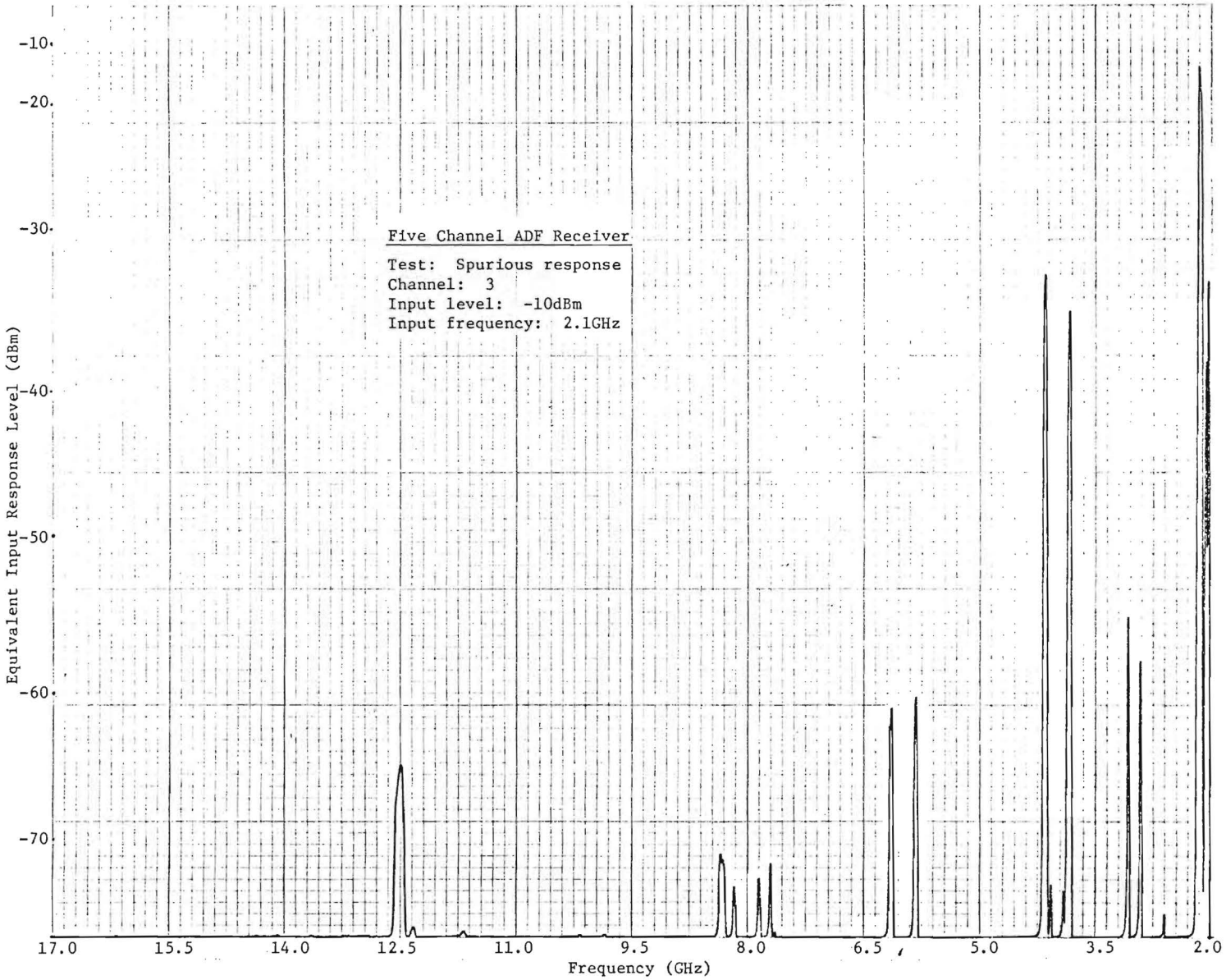

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -10dBm
Input frequency: 9.3 GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

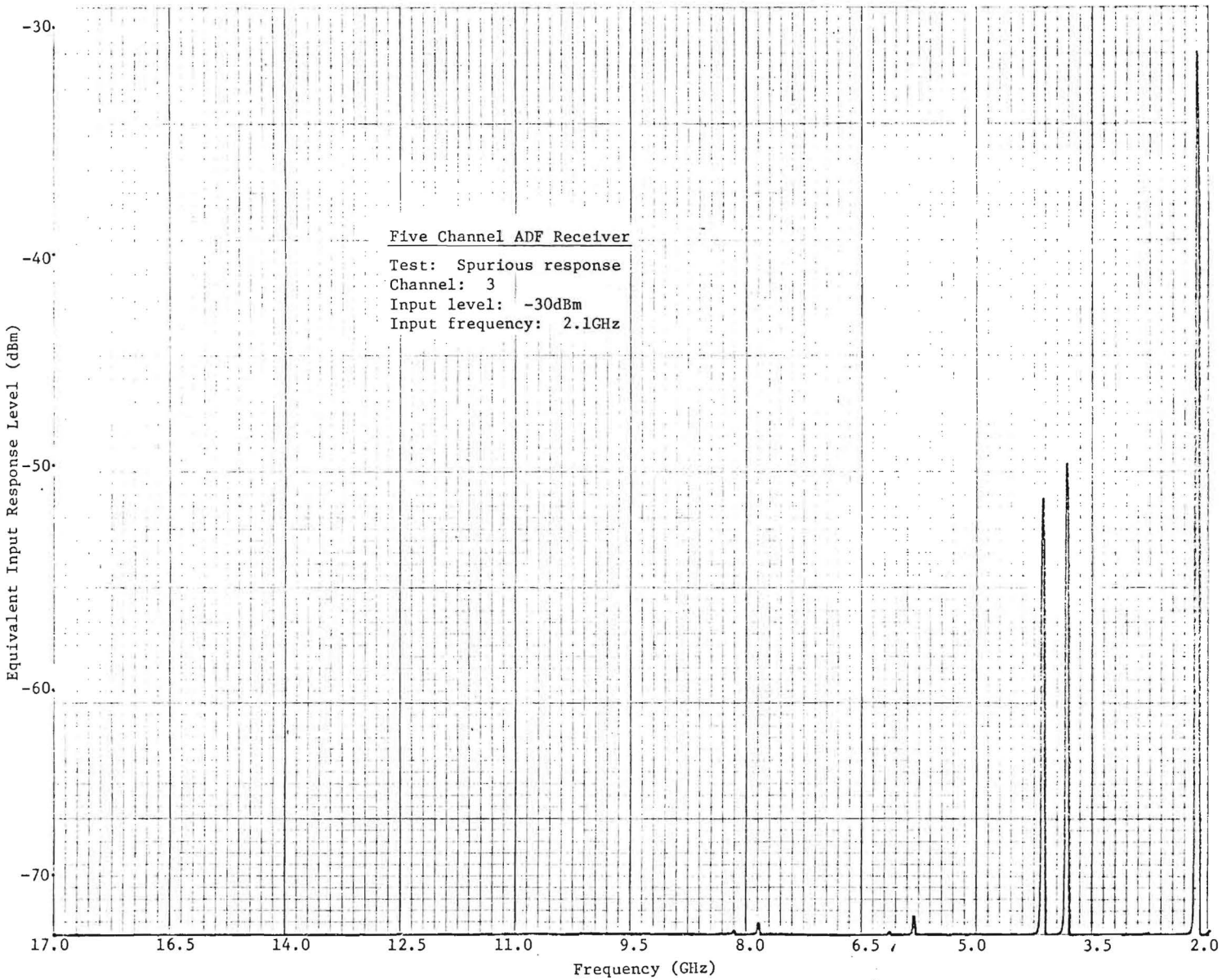

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -70dBm
Input frequency: 9.3GHz
-70
-80
-90
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

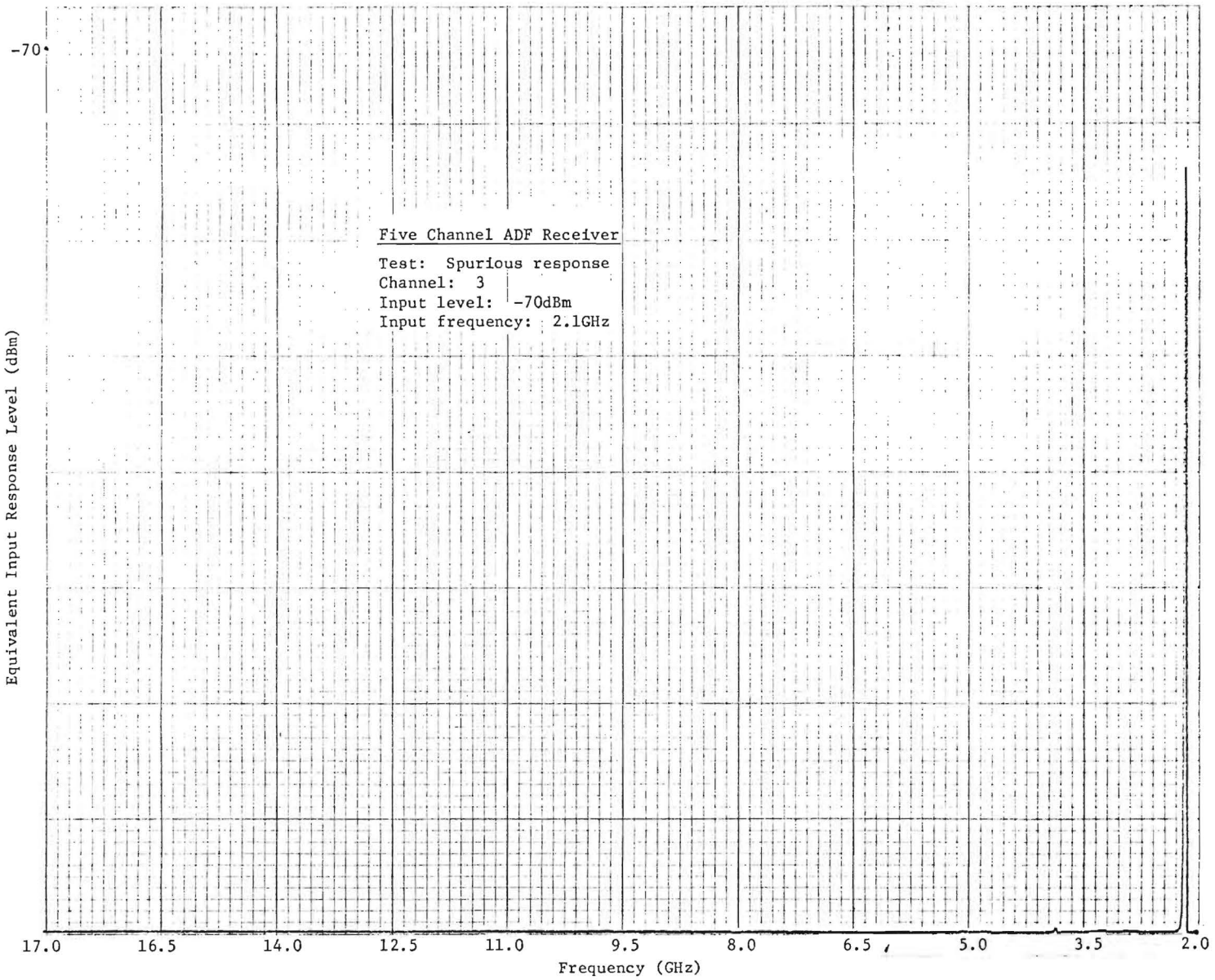

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -10dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

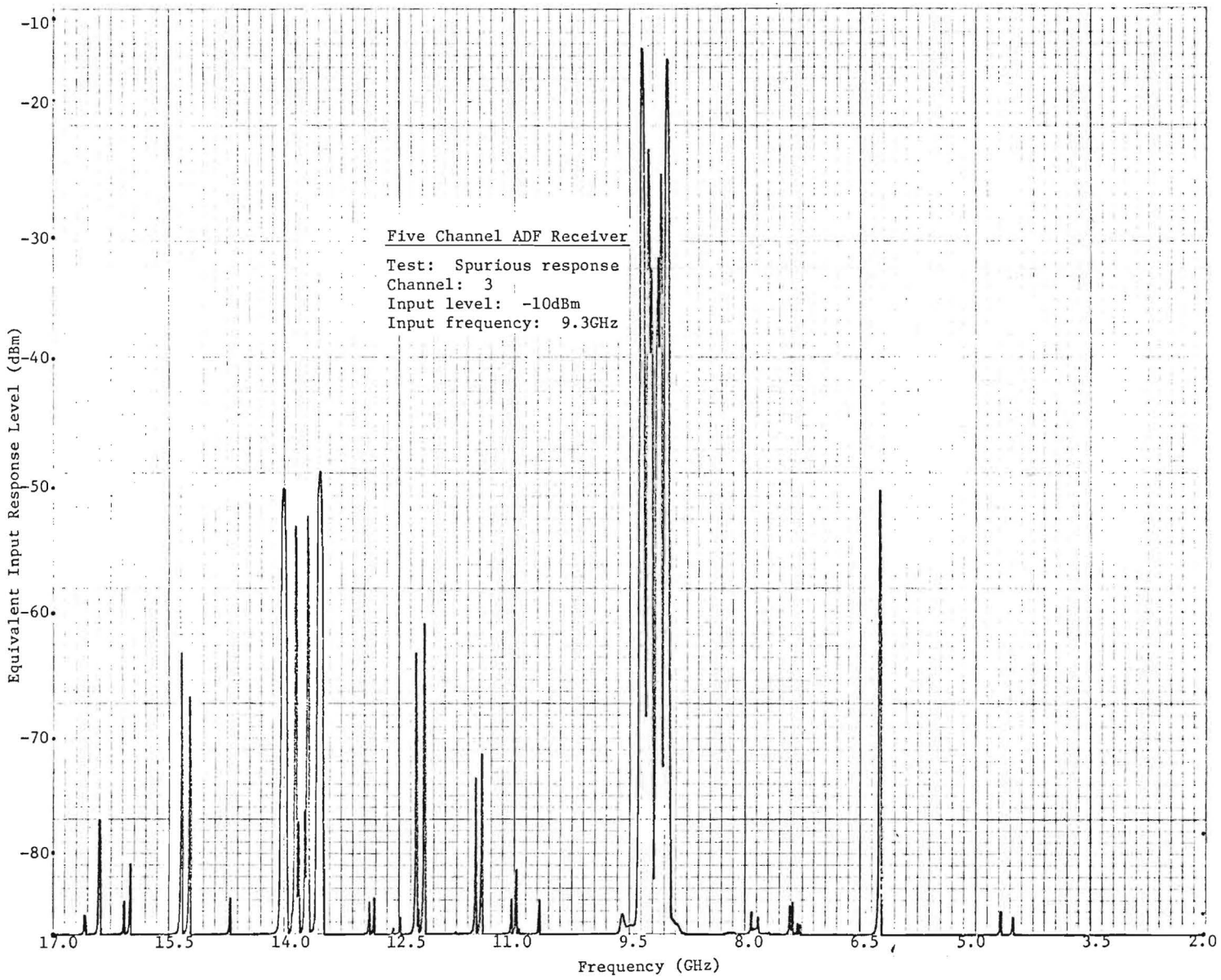

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -30dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

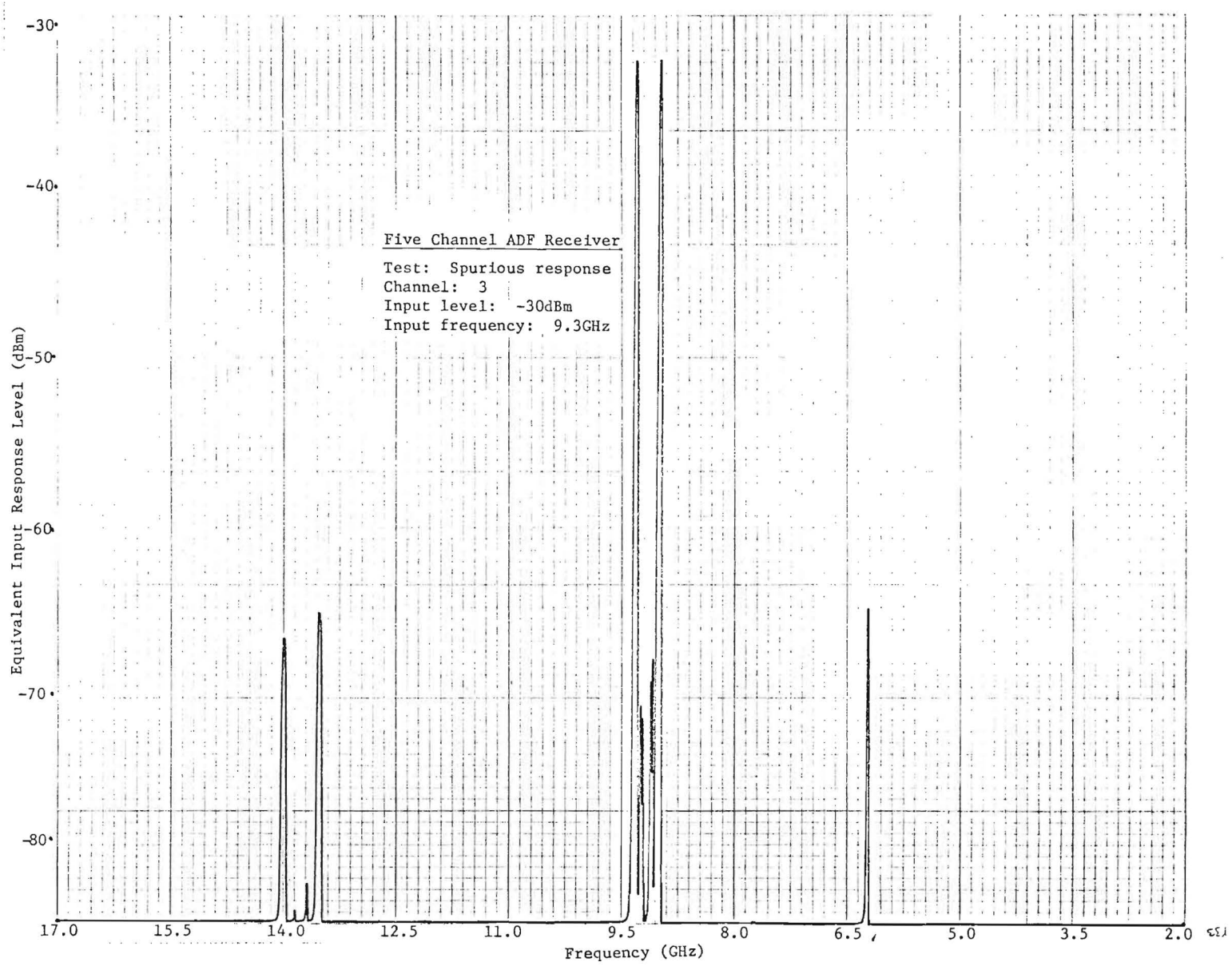

Five Channel ADF Receiver
Test: Spurious response
Channel: 2
Input level: -70dBm
Input frequency: 14.0GHz
-70
-80
-90
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

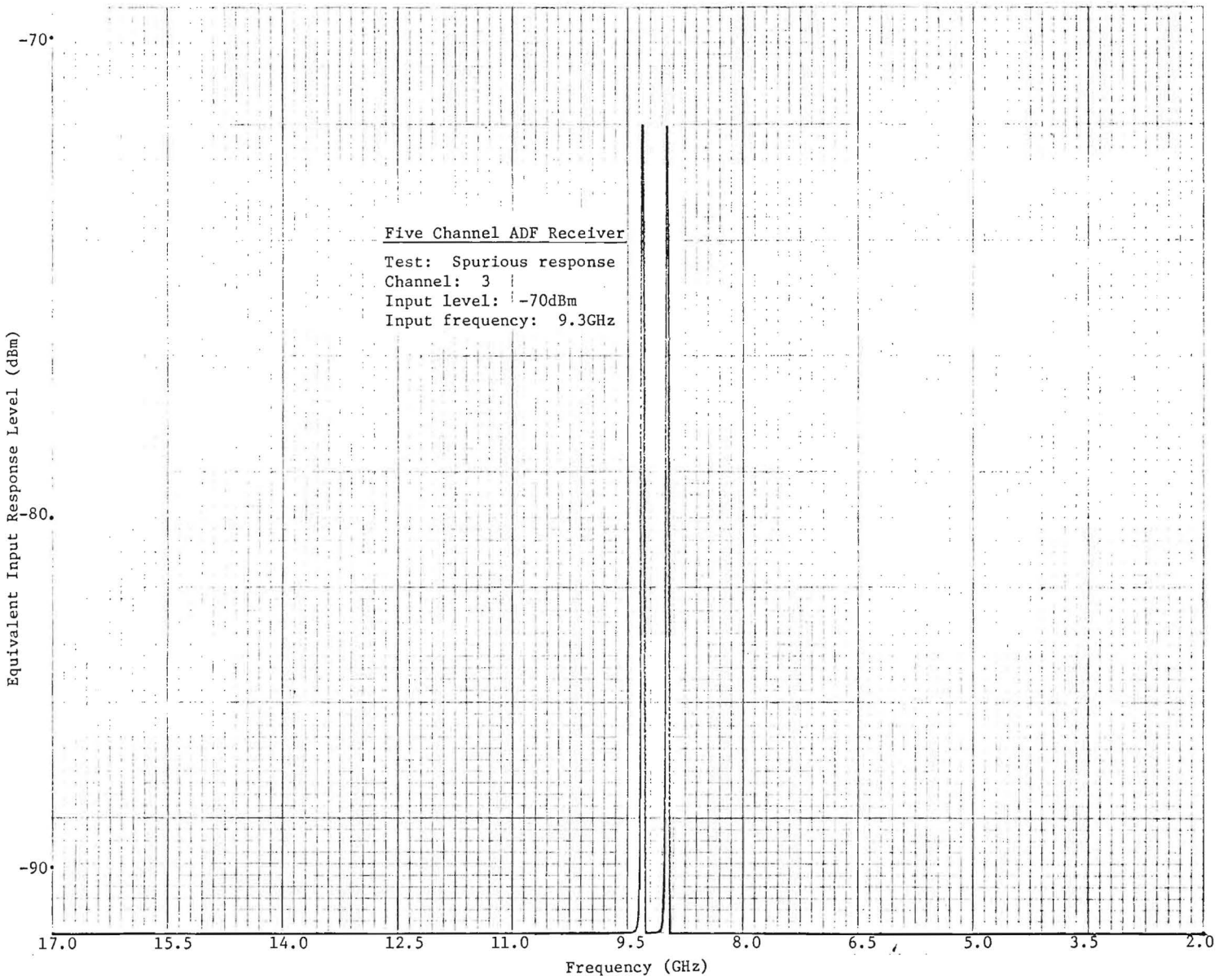

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -10dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

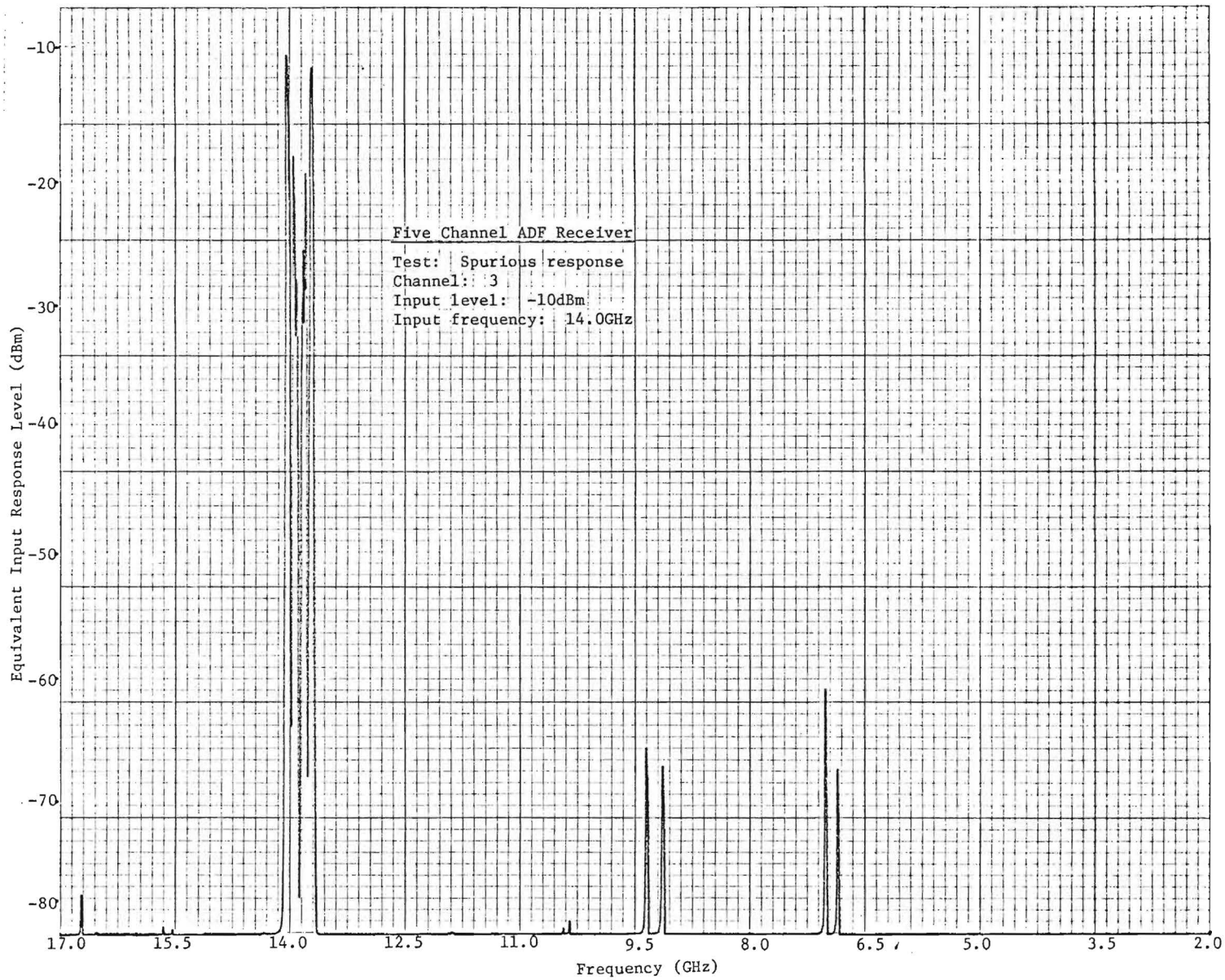

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -30dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
17.0
16.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

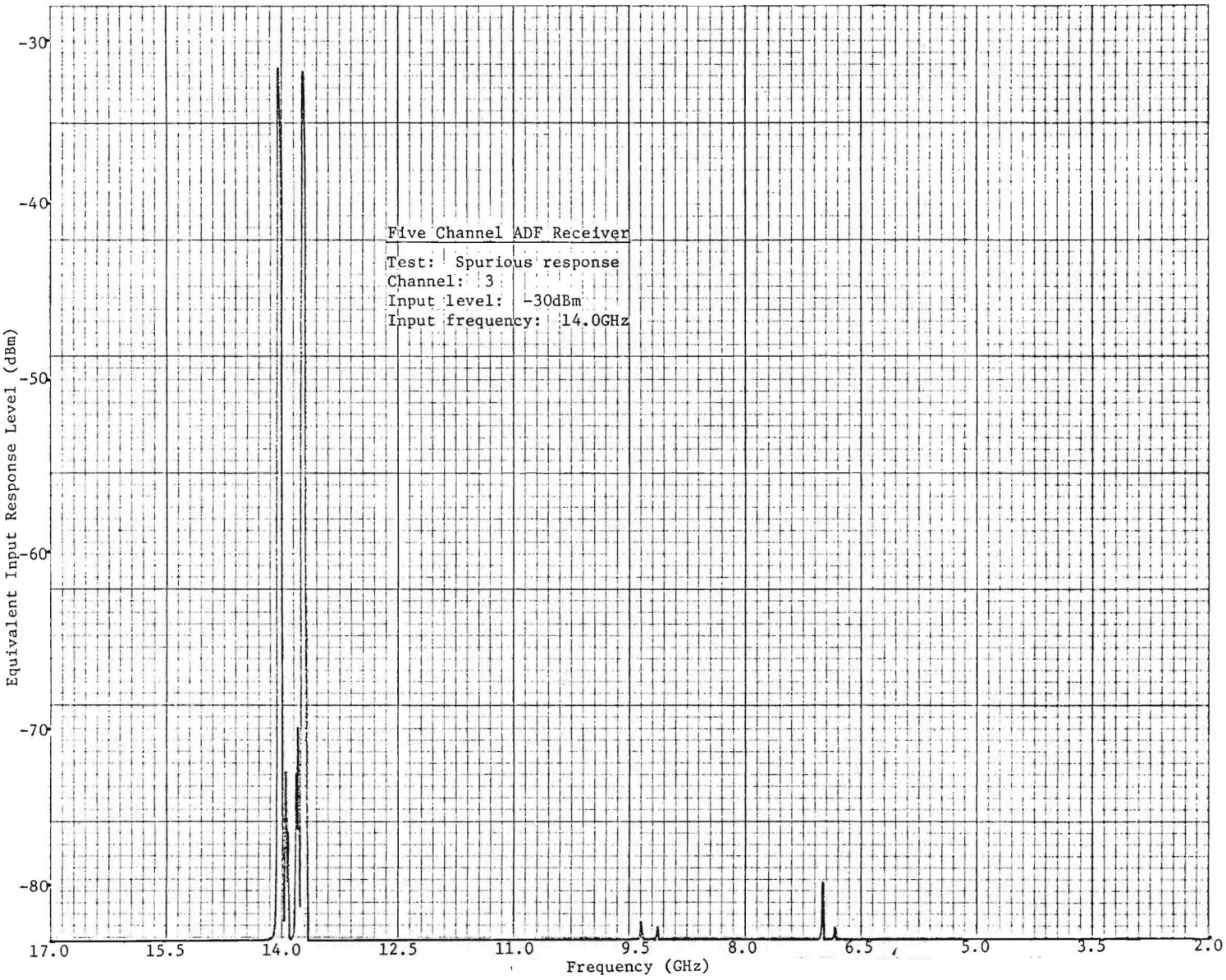

-70
Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -70dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
17.0
16.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

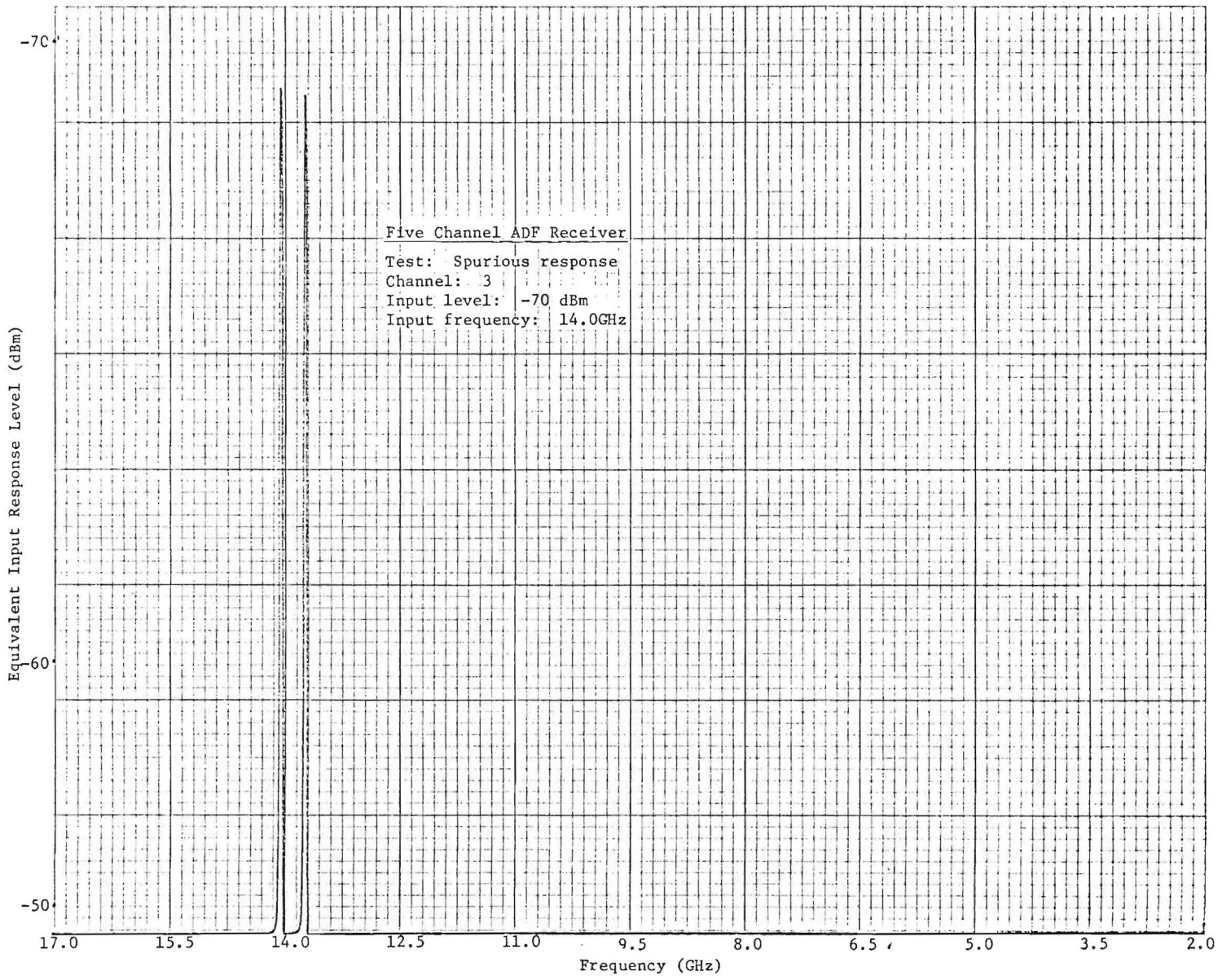

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -10dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

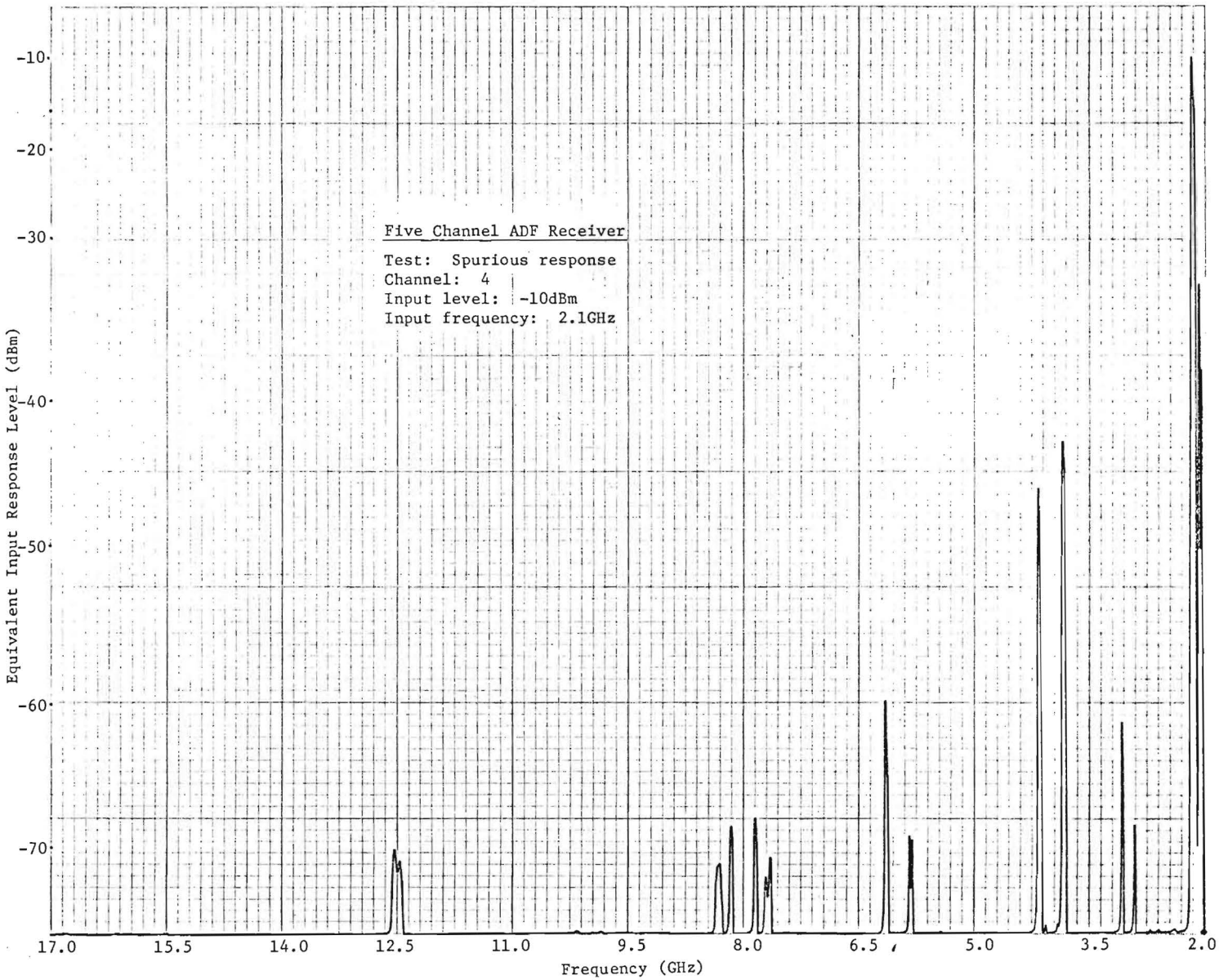

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -30dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

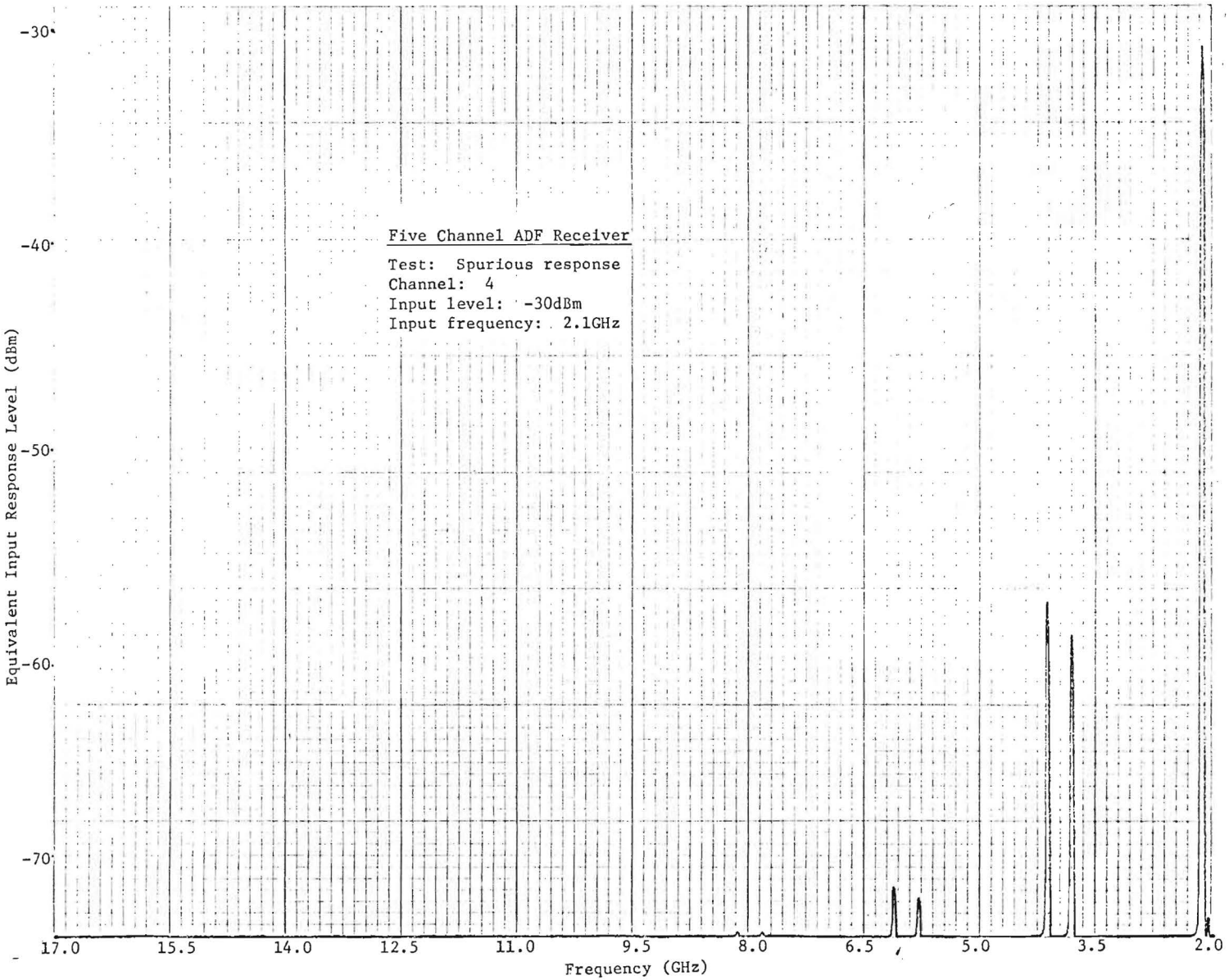

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -70dBm
Input frequency: 9.3GHz
-70
-80
-90
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

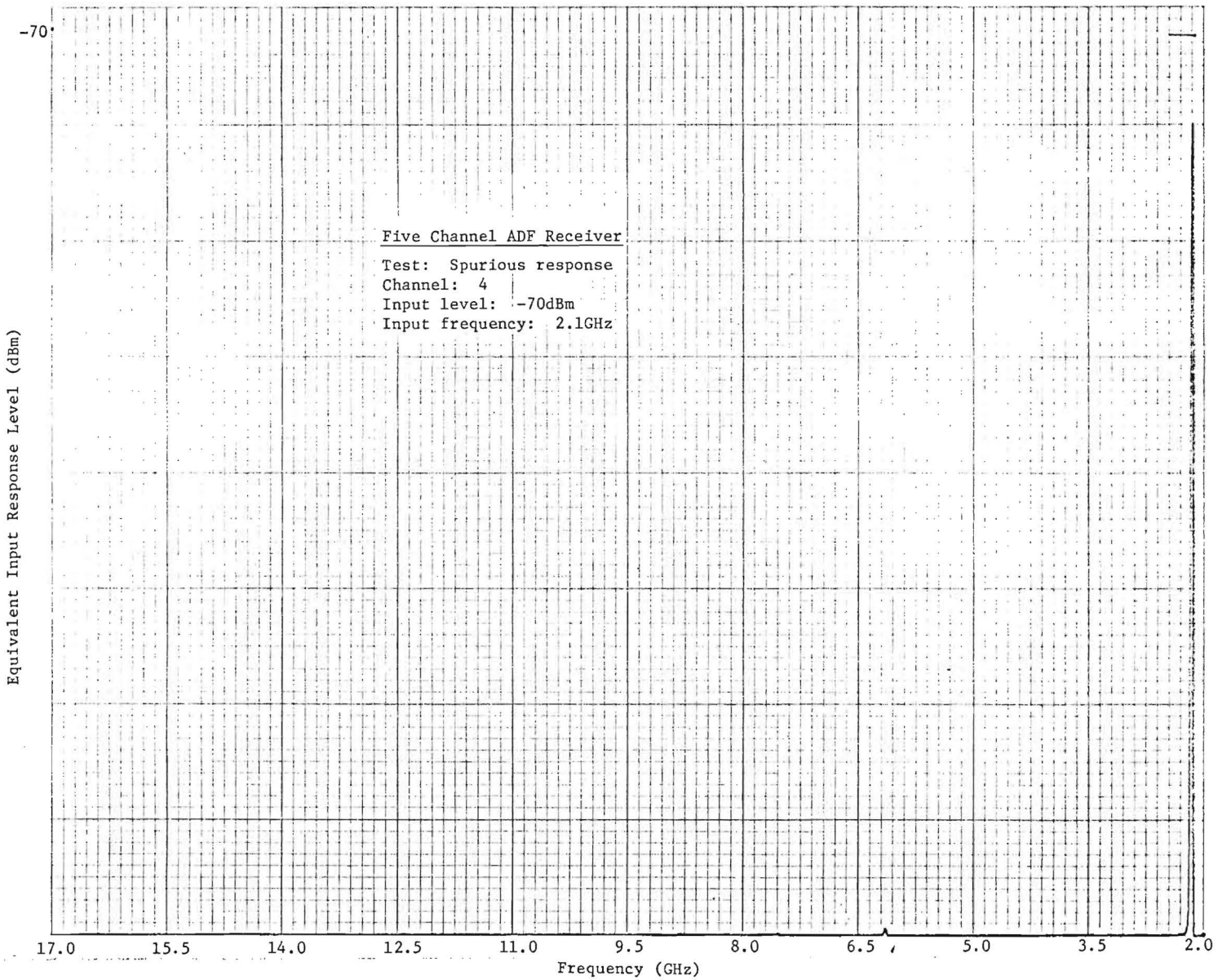

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -10dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

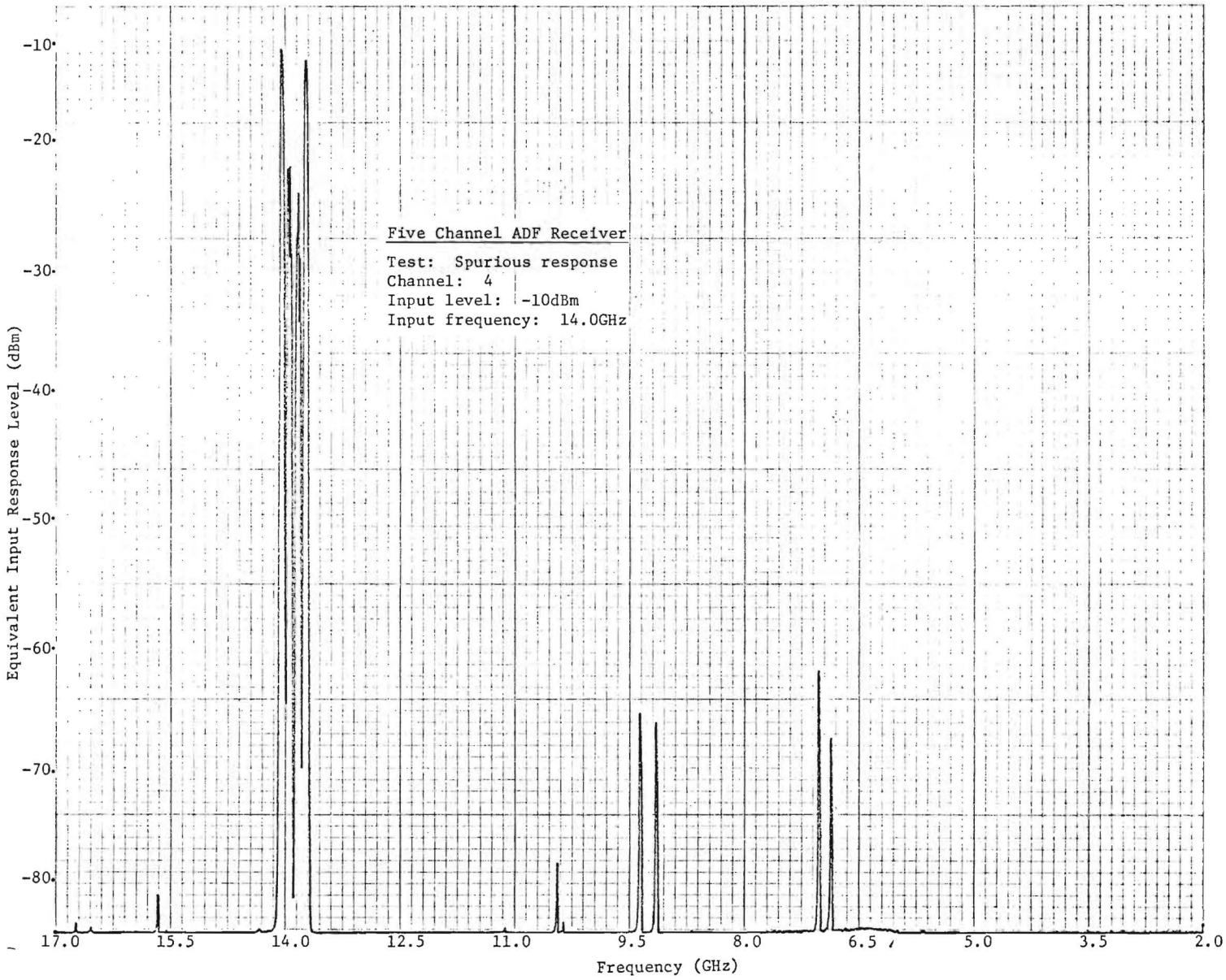

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -30dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

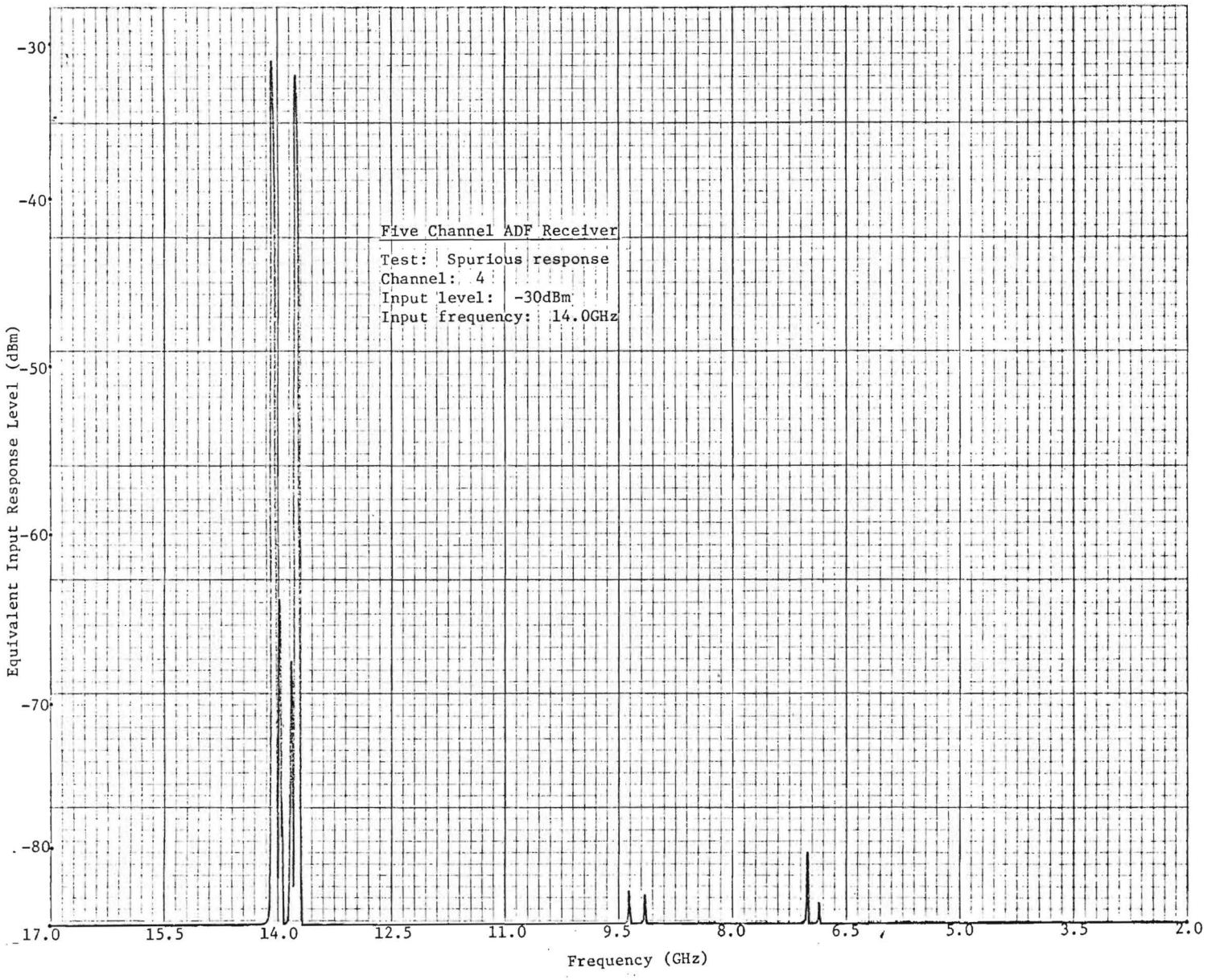

Five Channel ADF Receiver
Test: Spurious response
Channel: 3
Input level: -70 dBm
Input frequency: 14.0GHz
-70
-60
-50
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

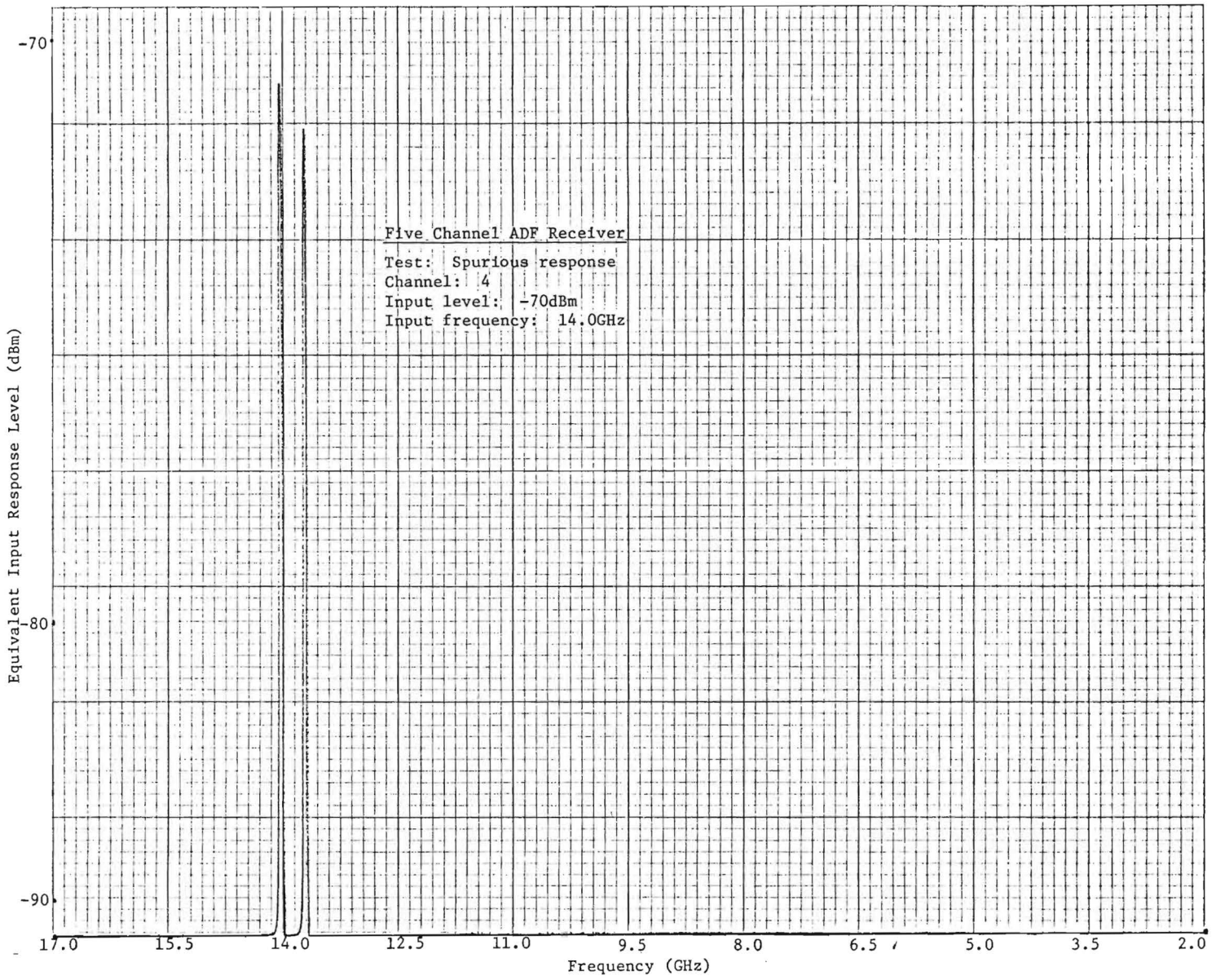

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -10dBm
Input frequency: 2.1GHz
-10
-20
-30
-40
-50
-60
-70
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

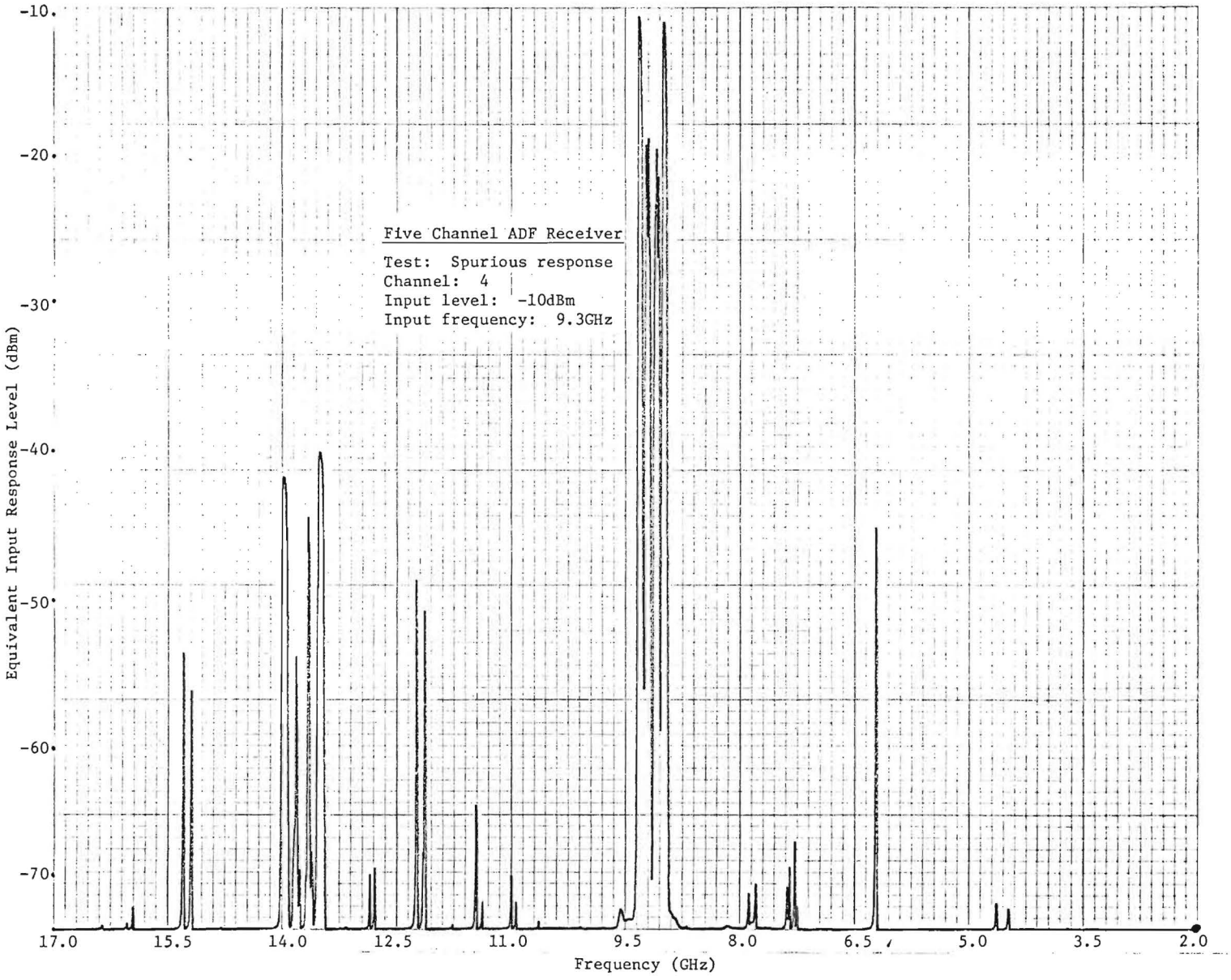

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -30dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

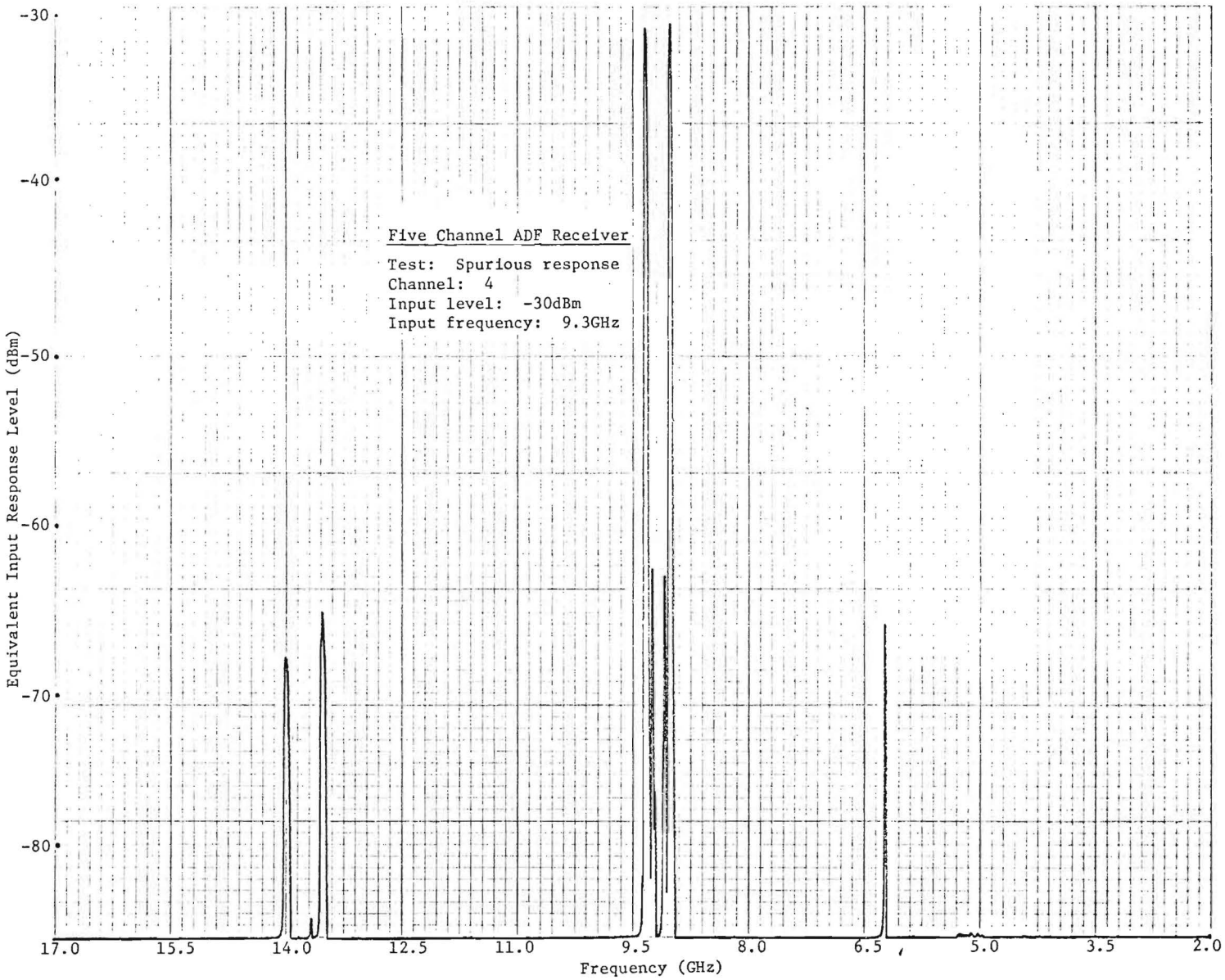

-70
Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -70dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

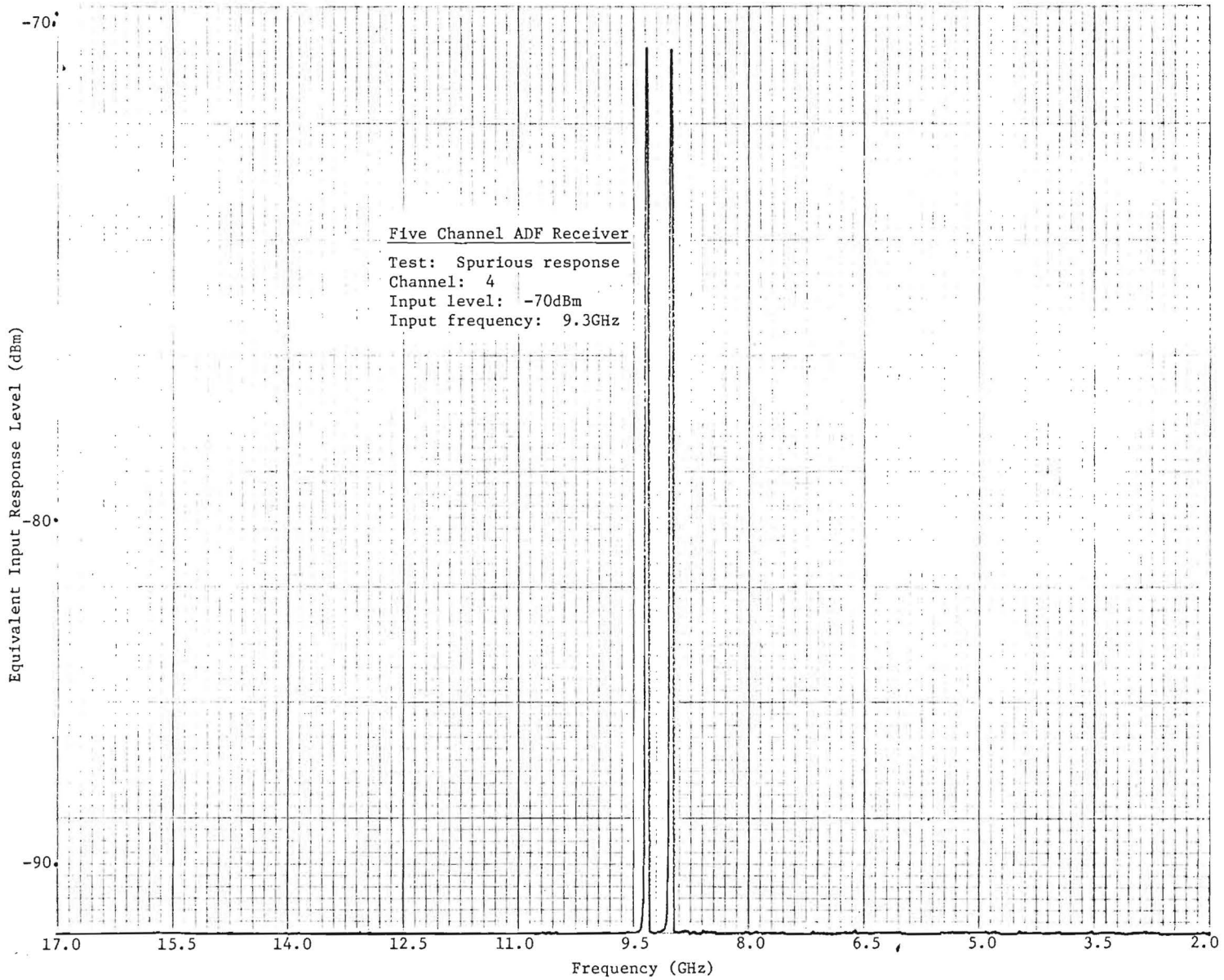

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -10dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

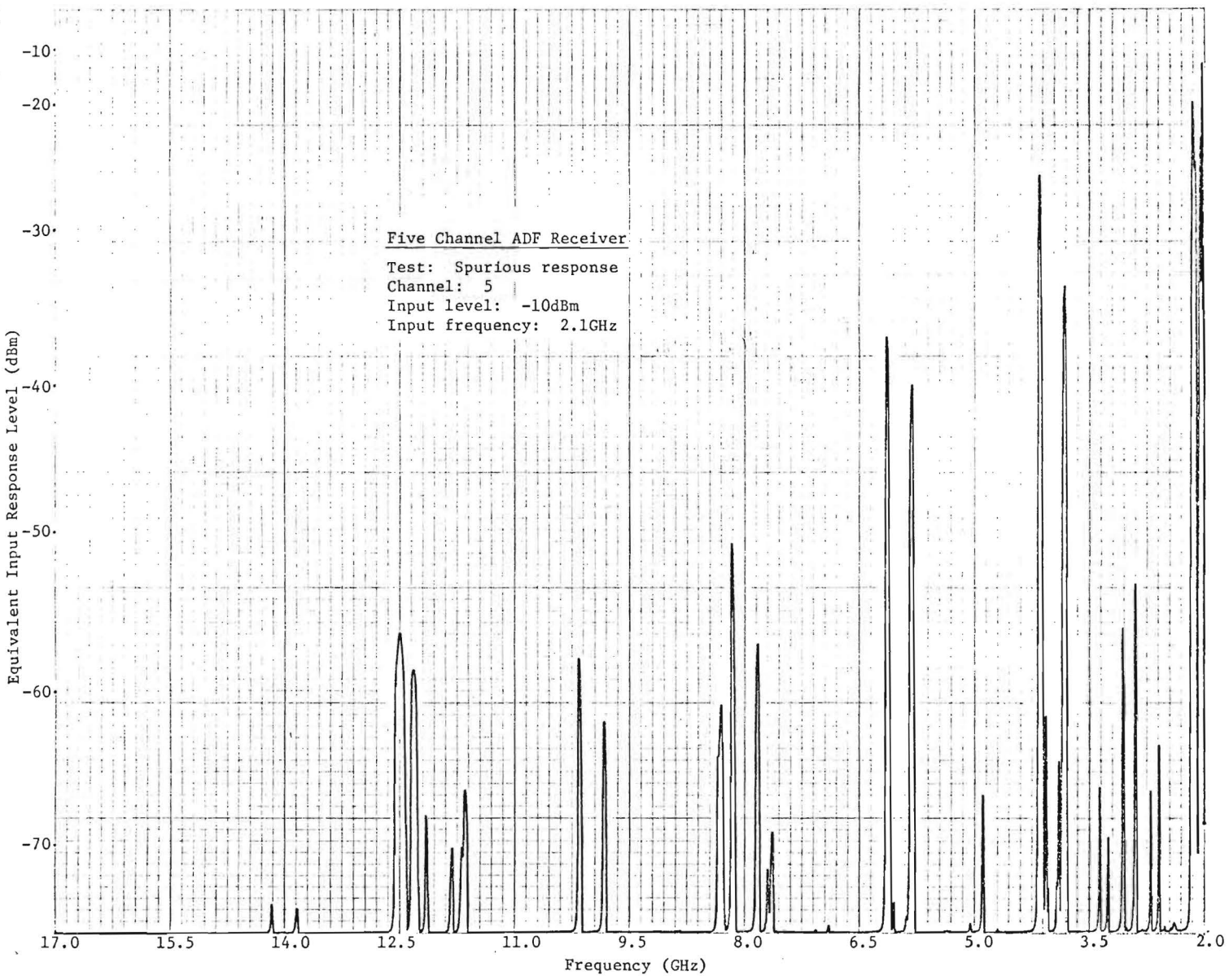

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -30dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

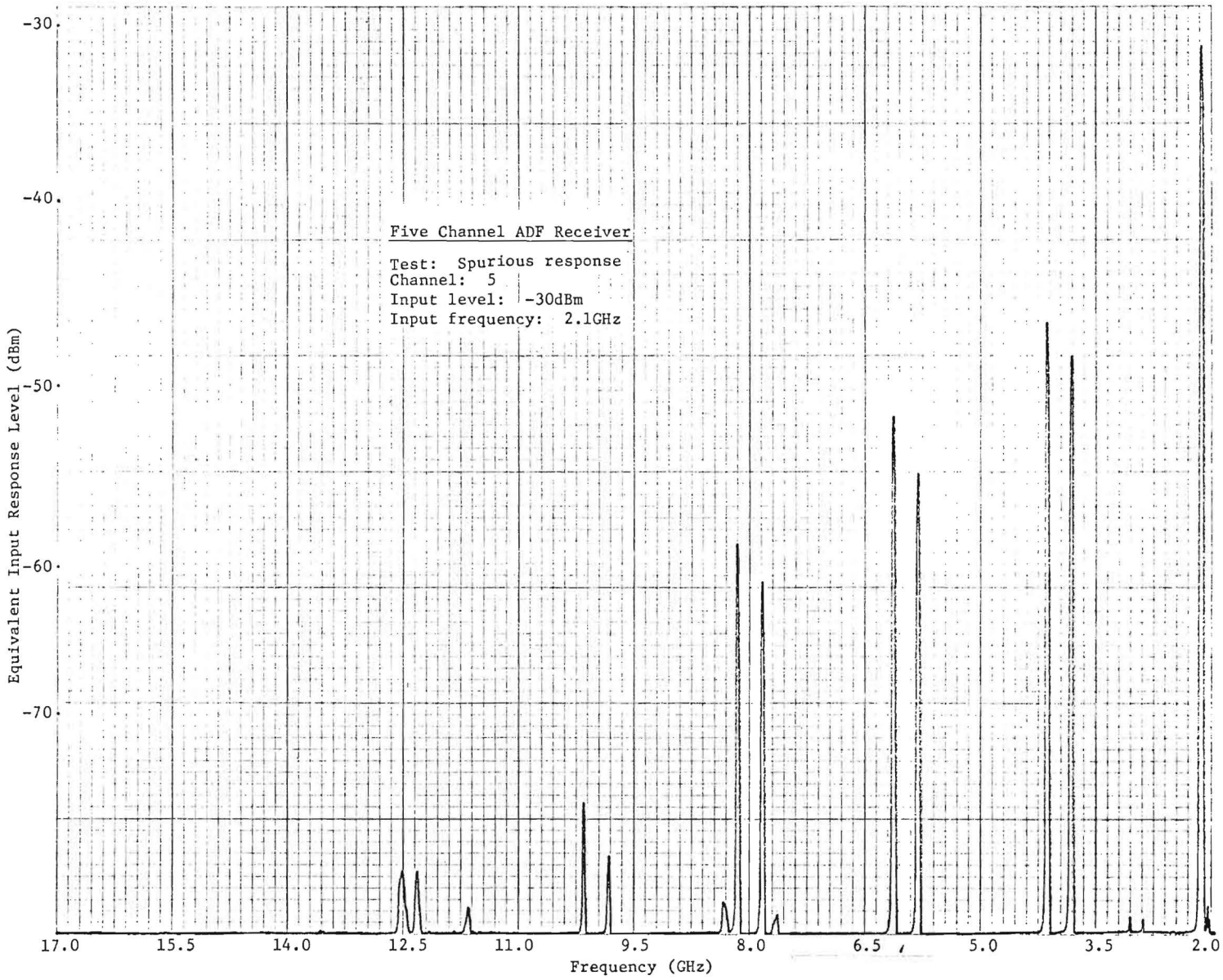

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -70dBm
Input frequency: 14.0GHz
-70
-80
-90
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

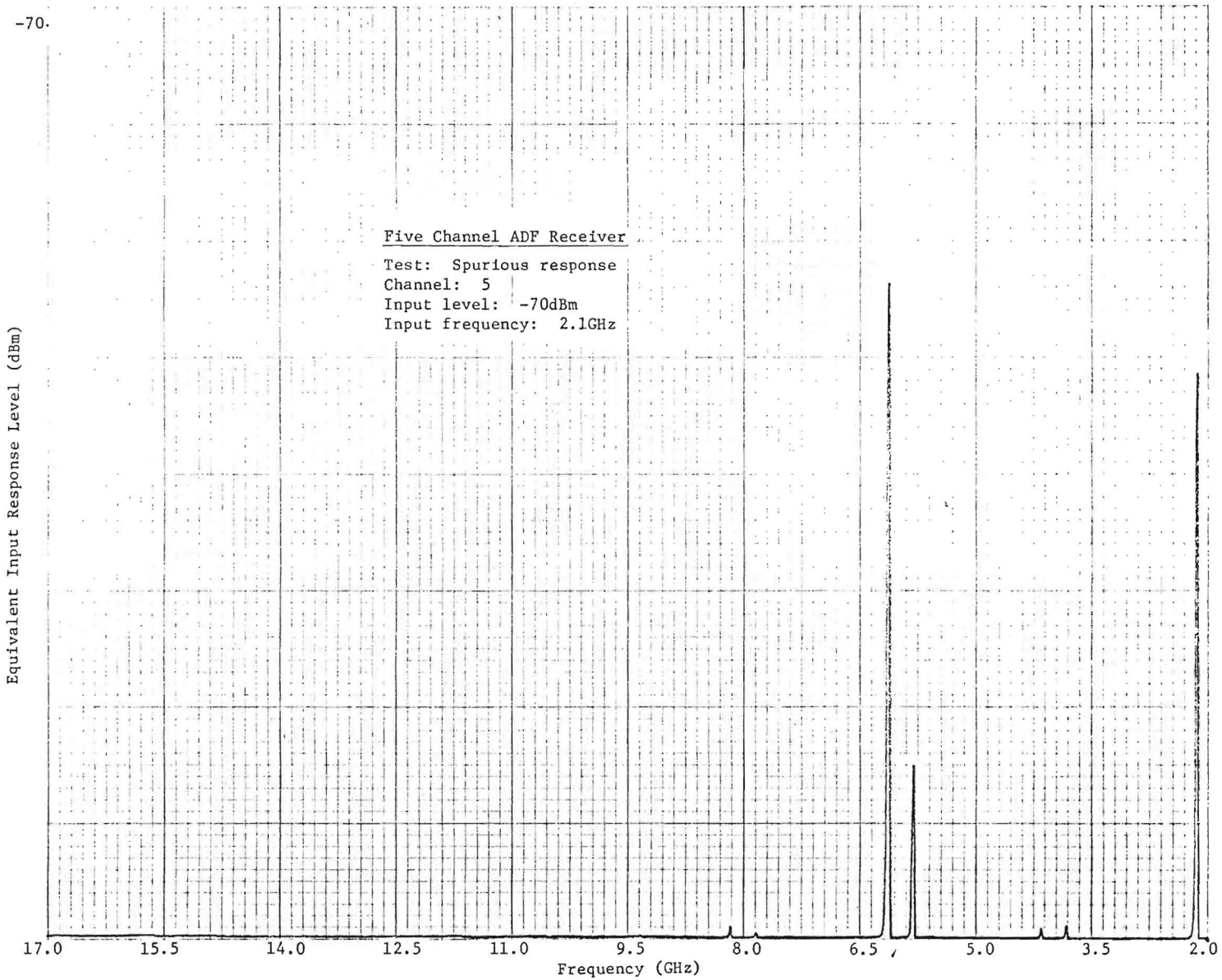

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -10dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

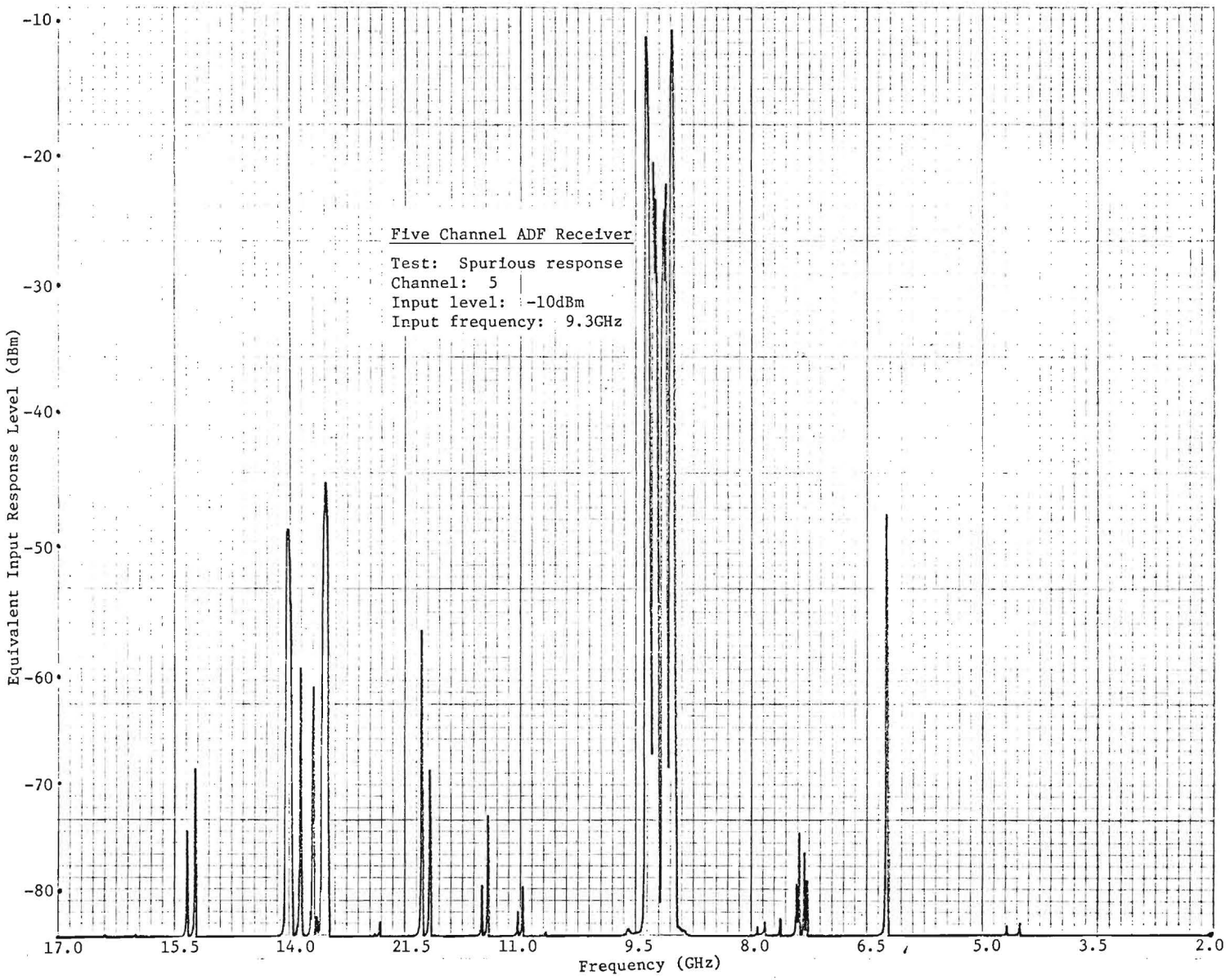

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -30dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

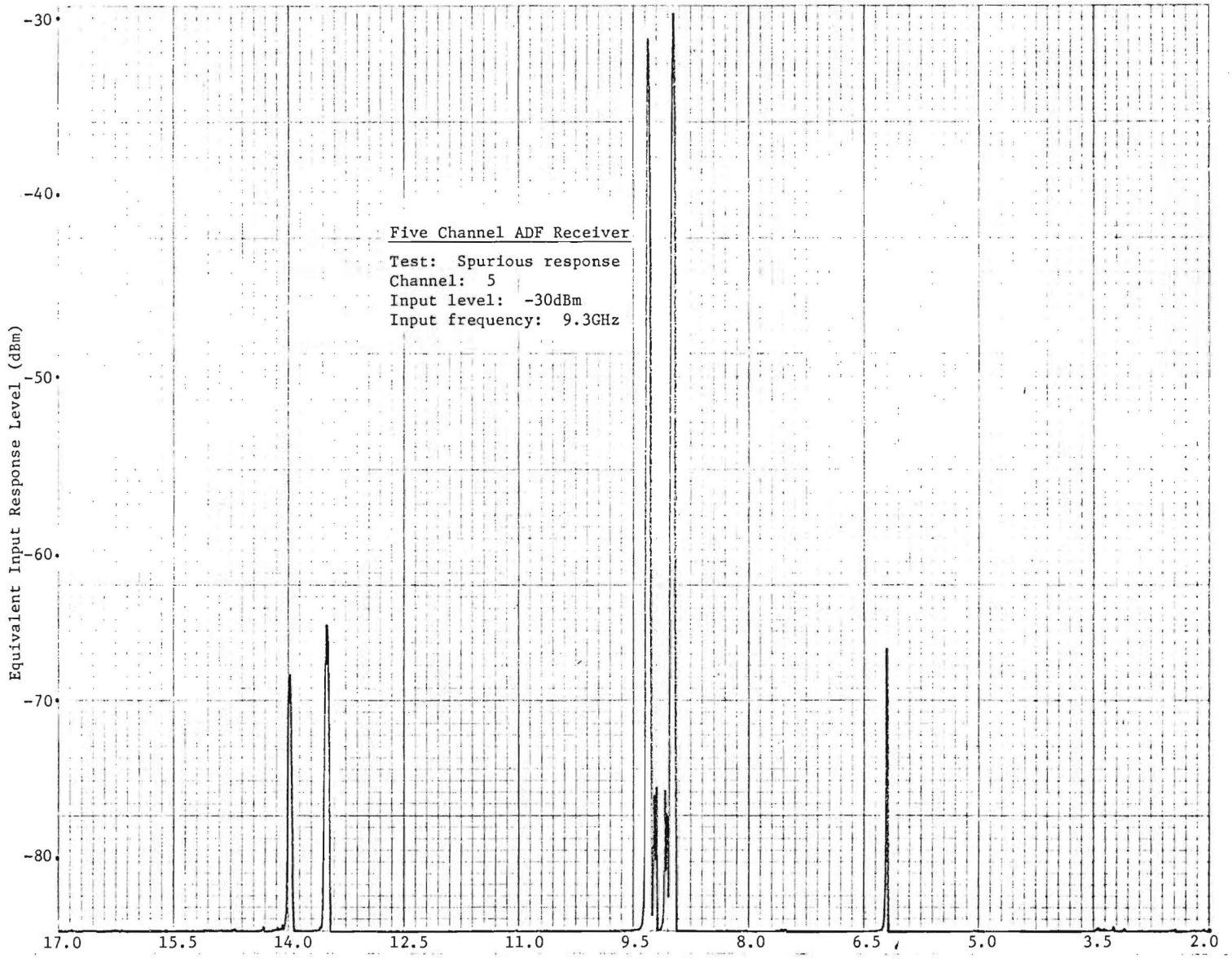

Five Channel ADF Receiver
Test: Spurious response
Channel: 4
Input level: -70dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-70
-80
-90
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

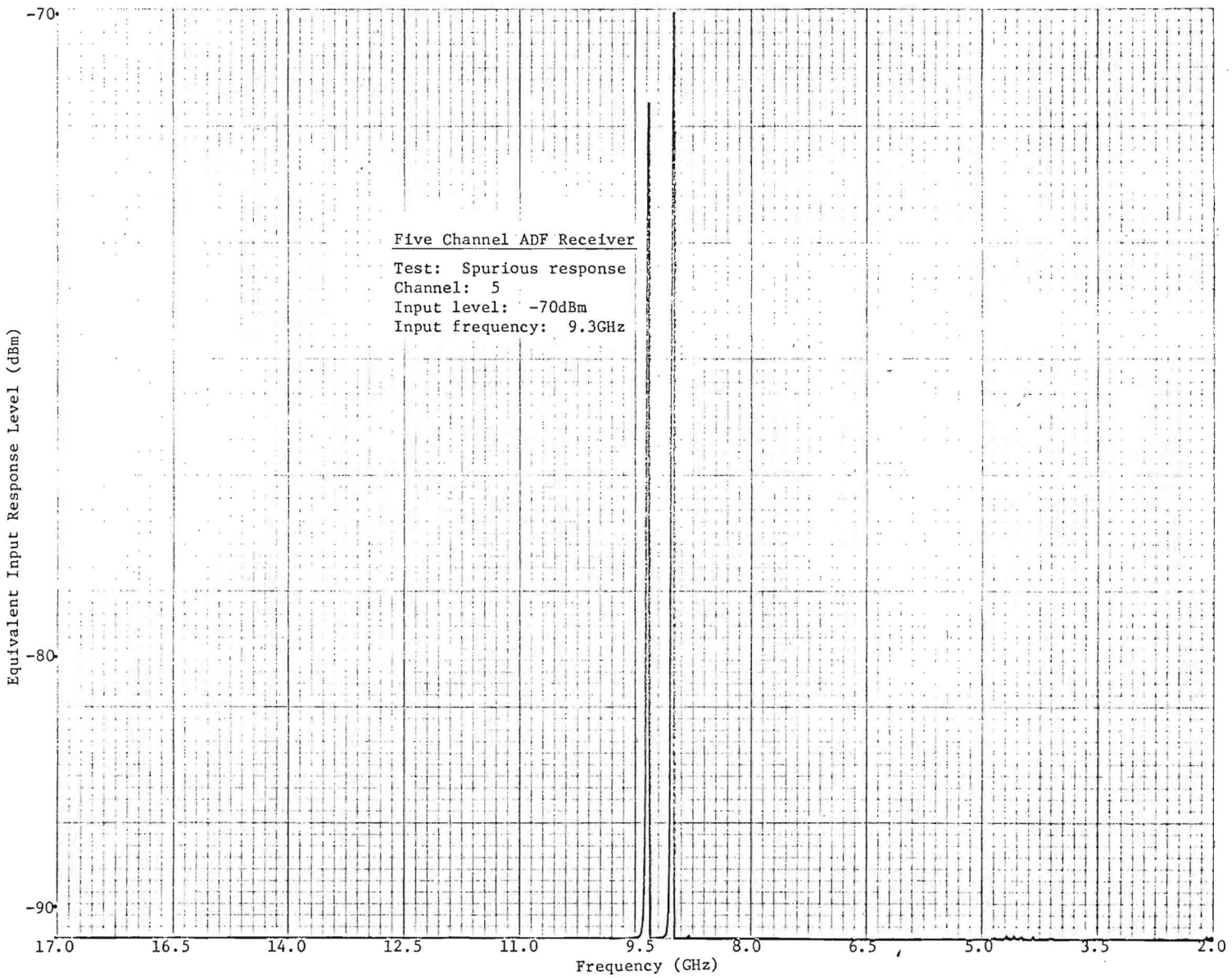

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -10dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

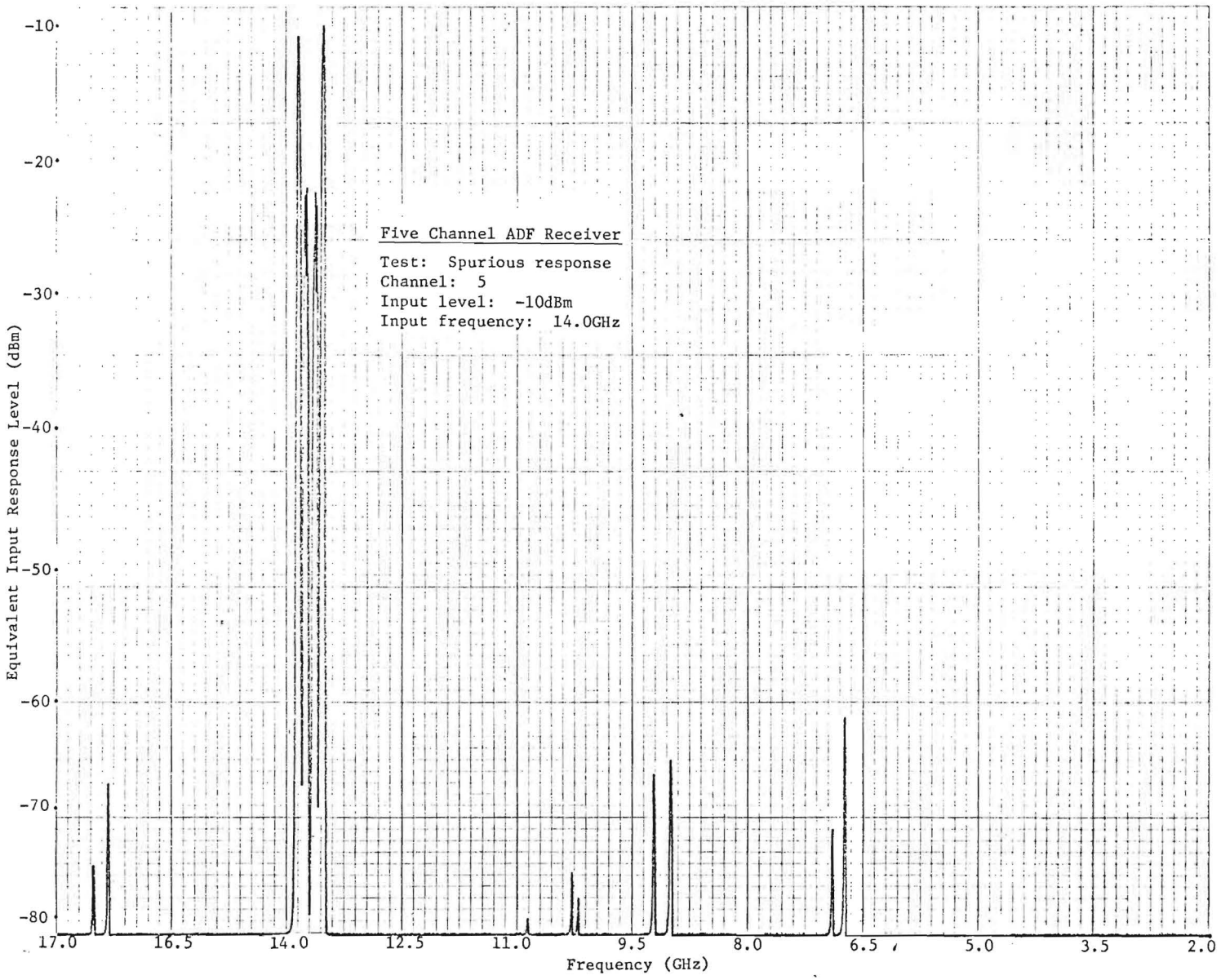

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -30dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

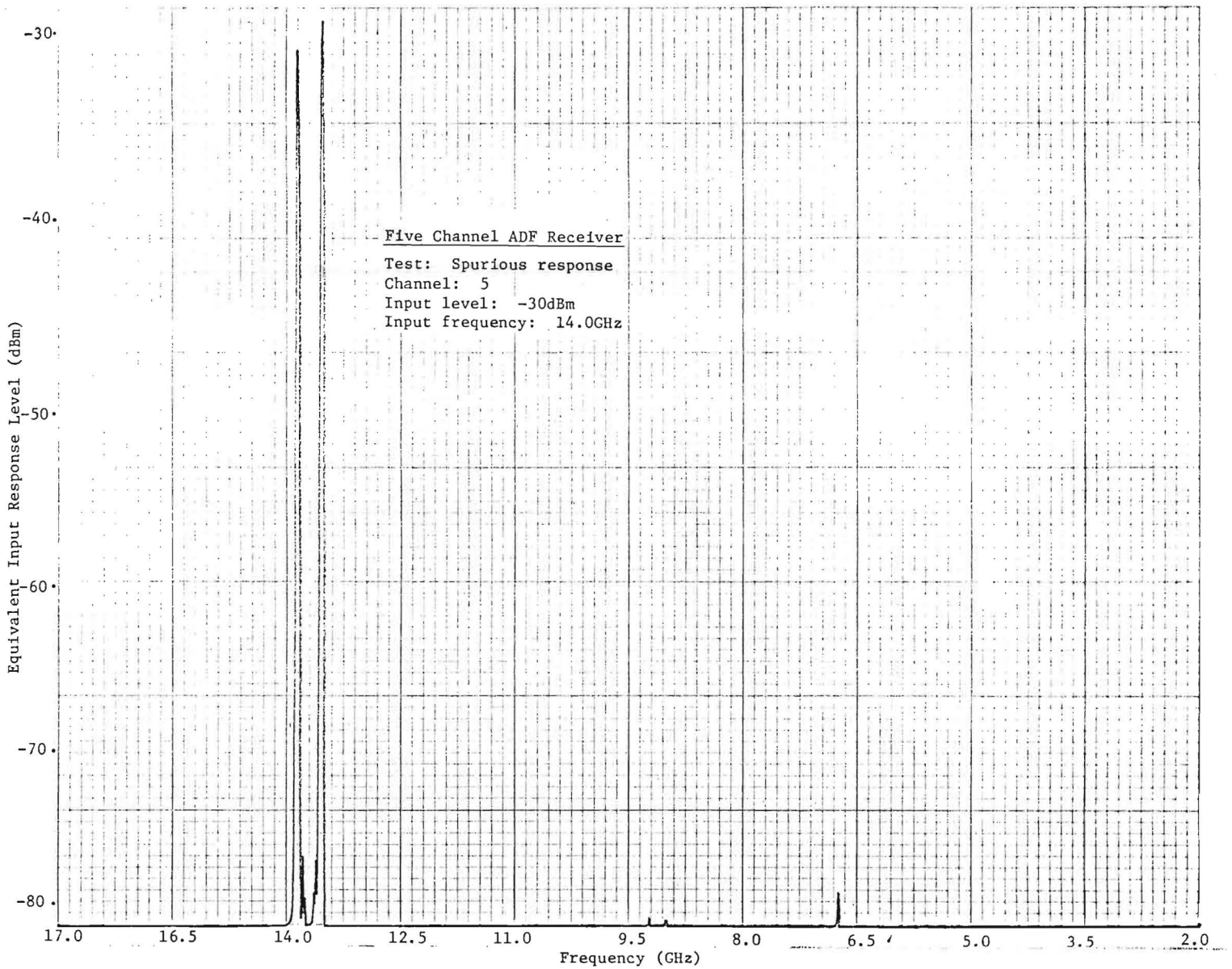

-70
Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -70dBm
Input frequency: 2.1GHz
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

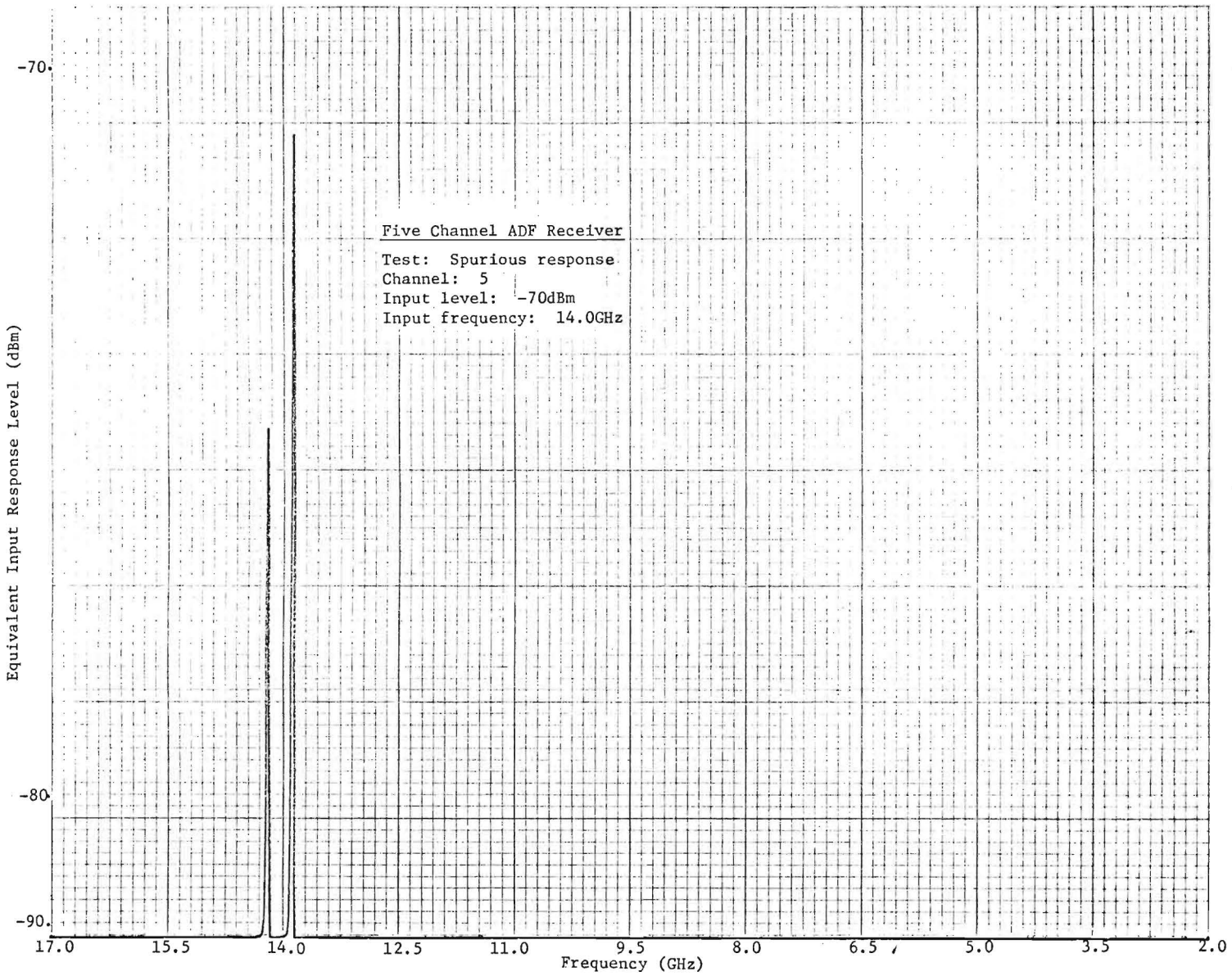

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -10dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
21.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

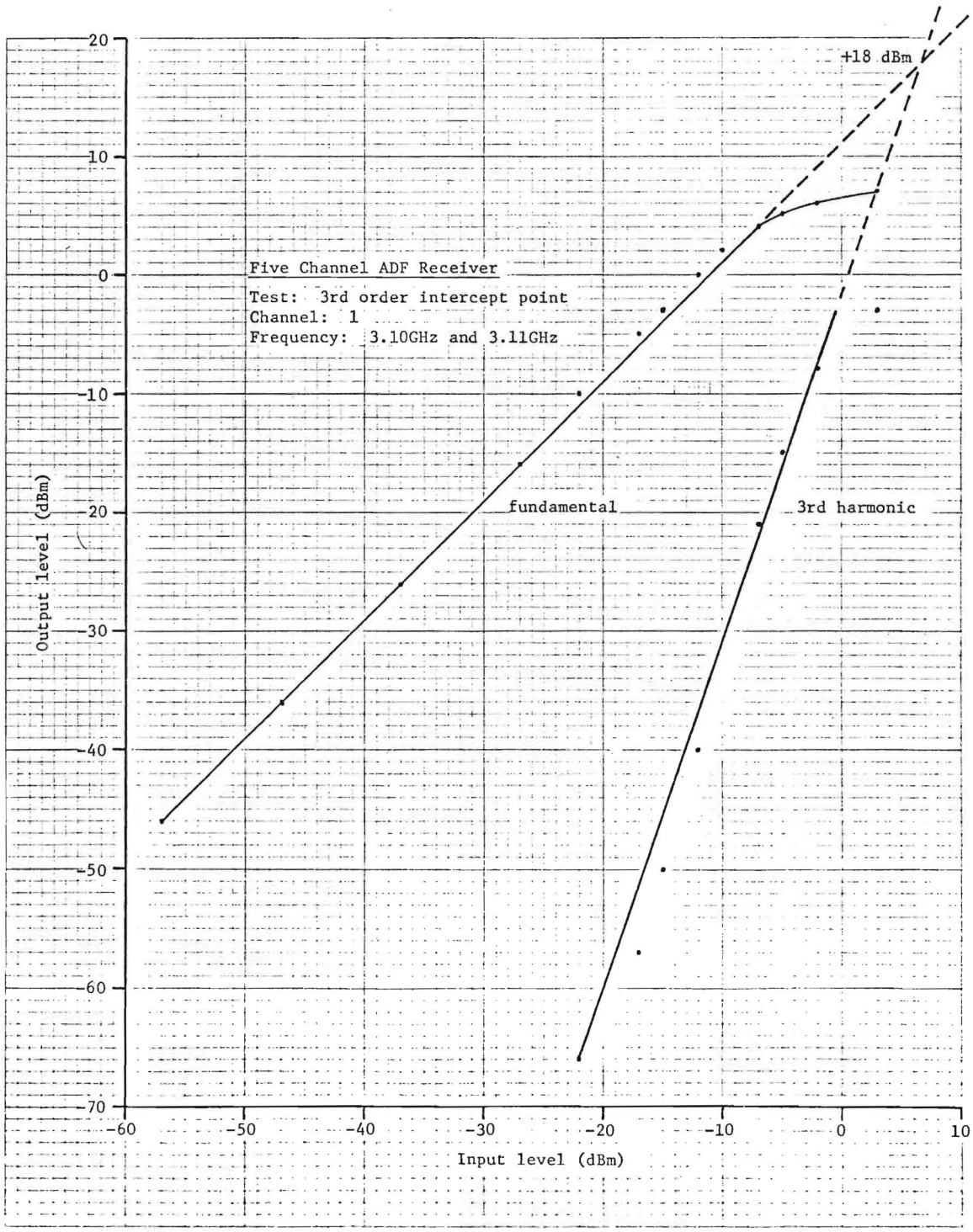

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -30dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0

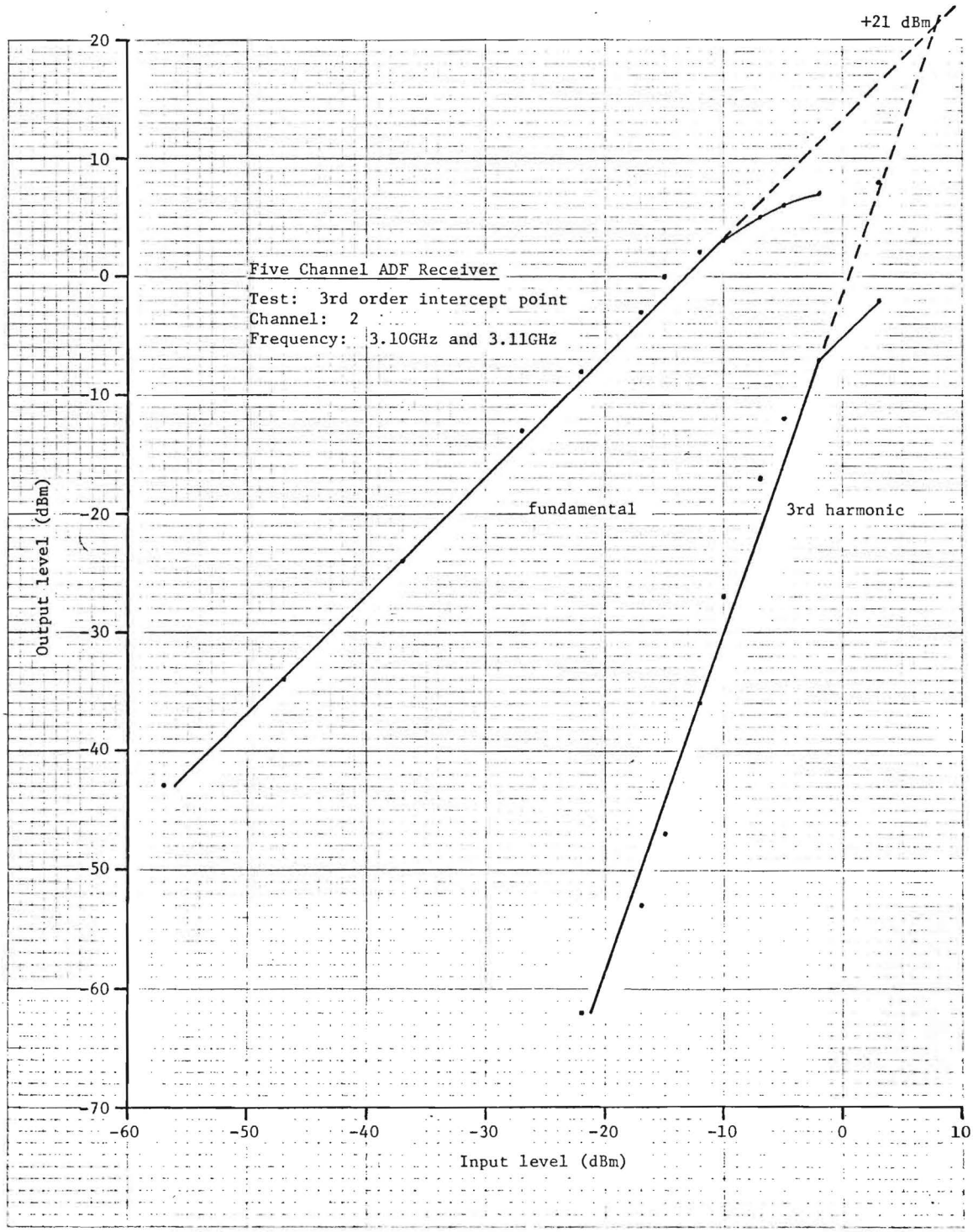

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -70dBm
Input frequency: 9.3GHz
Equivalent Input Response Level (dBm)
-70
-80
-90
17.0
16.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

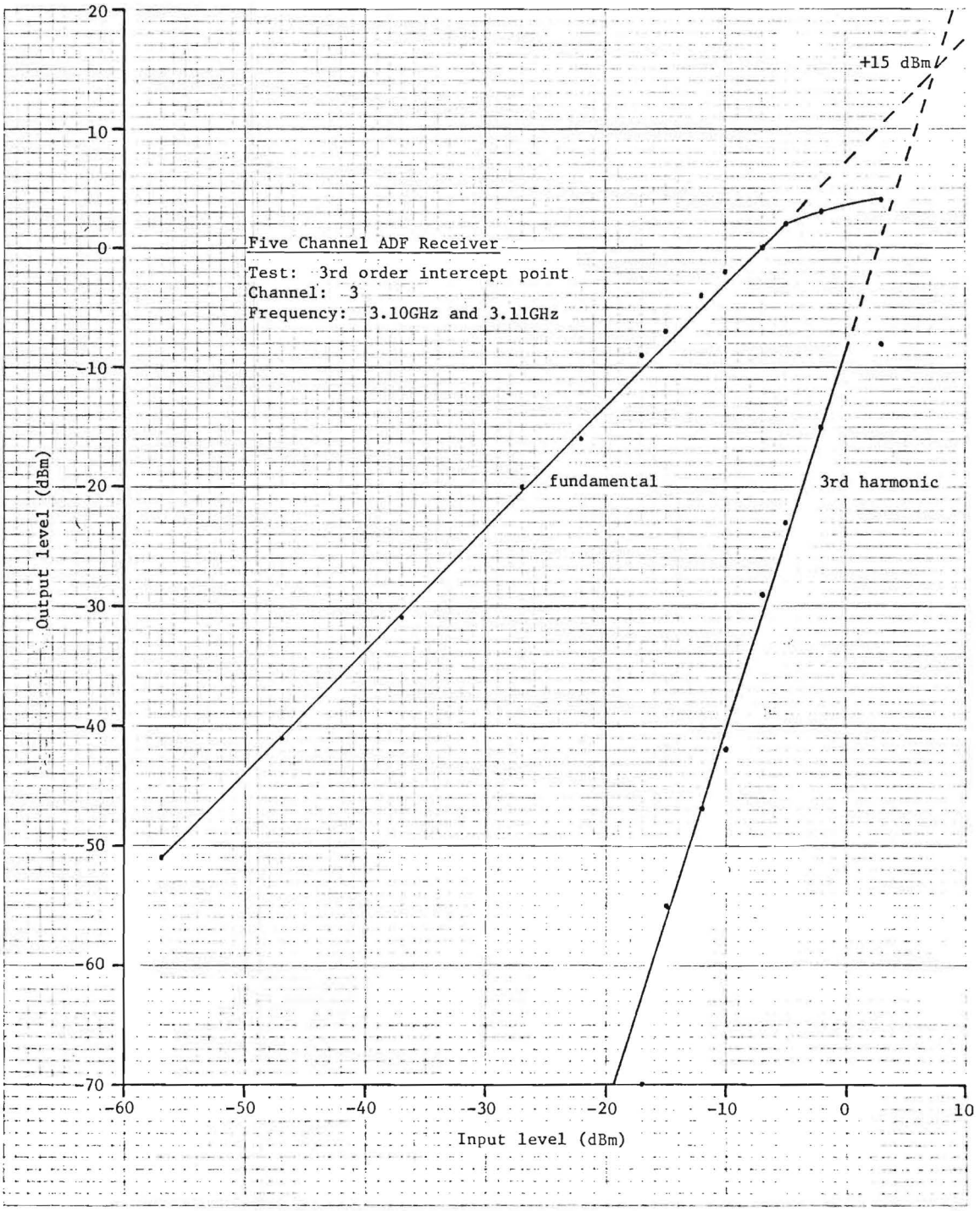

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -10dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-10
-20
-30
-40
-50
-60
-70
-80
17.0
16.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

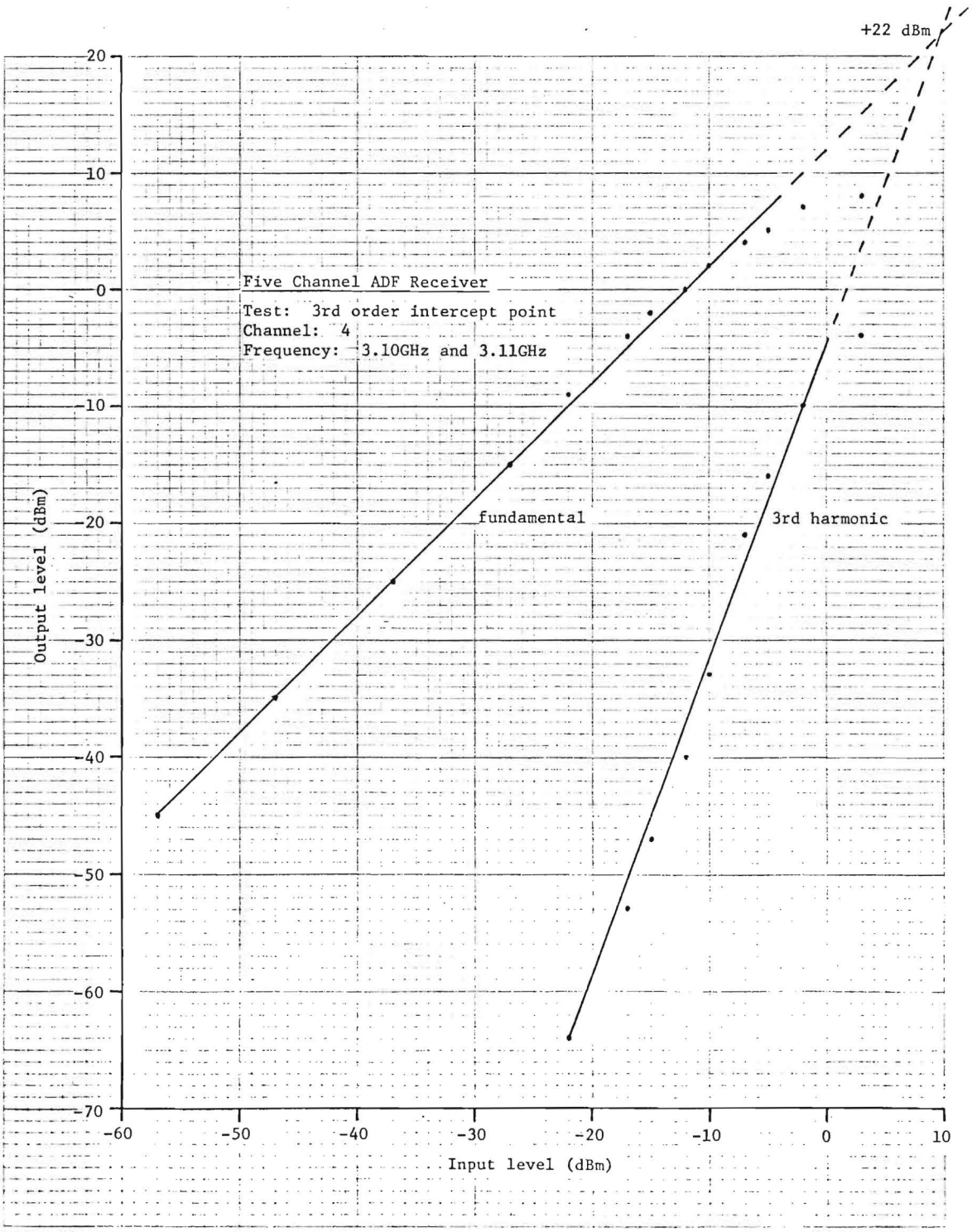

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -30dBm
Input frequency: 14.0GHz
Equivalent Input Response Level (dBm)
-30
-40
-50
-60
-70
-80
17.0
16.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)

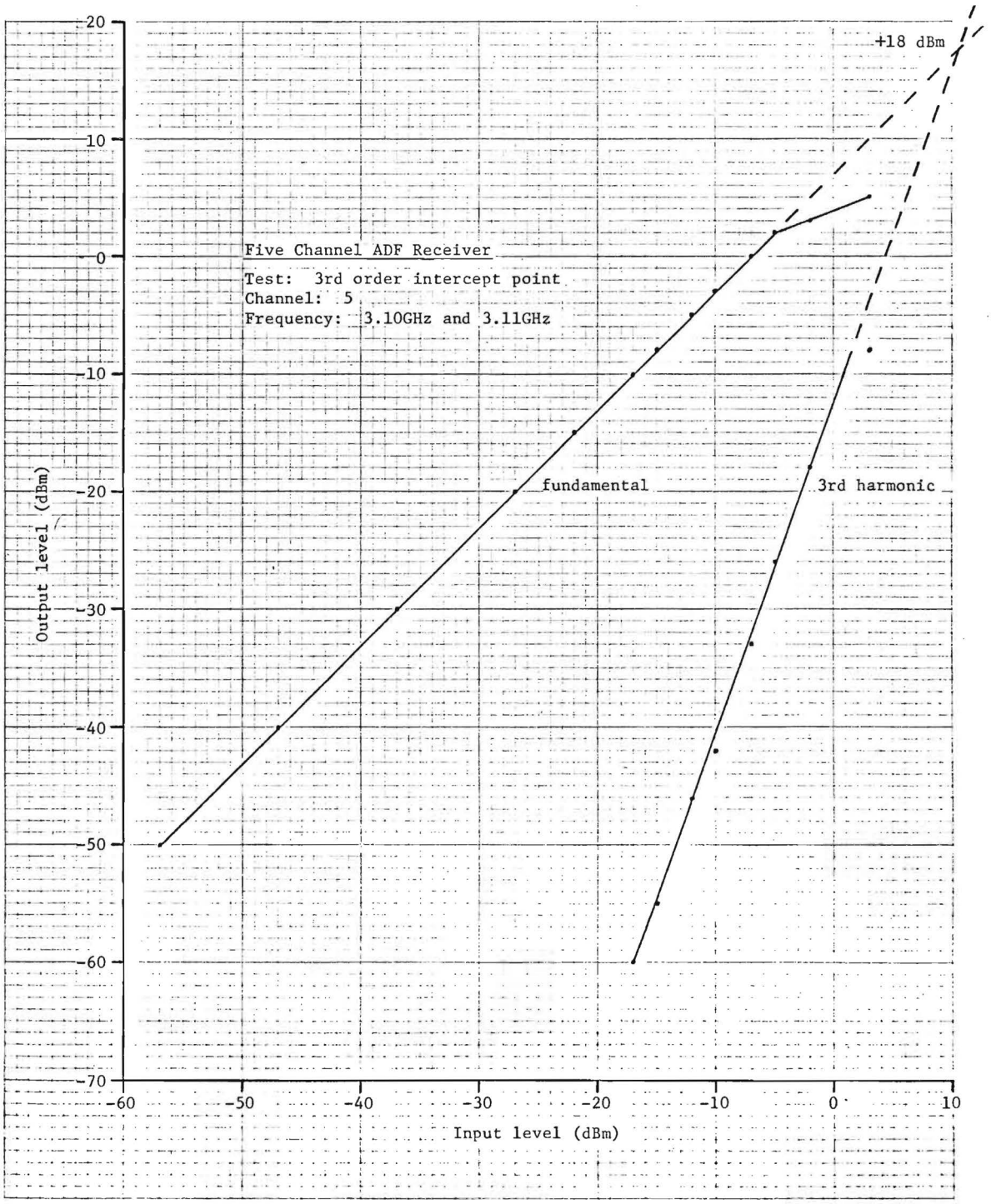

Five Channel ADF Receiver
Test: Spurious response
Channel: 5
Input level: -70dBm
Input frequency: 14.0GHz
-70
-80
-90
Equivalent Input Response Level (dBm)
17.0
15.5
14.0
12.5
11.0
9.5
8.0
6.5
5.0
3.5
2.0
Frequency (GHz)


+18 dBm
Five Channel ADF Receiver
Test: 3rd order intercept point
Channel: 1
Frequency: 3.10GHz and 3.11GHz
fundamental
3rd harmonic
Output level (dBm)
Input level (dBm)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-60
-50
-40
-30
-20
-10
0
10


+21 dBm
Five Channel ADF Receiver
Test: 3rd order intercept point
Channel: 2
Frequency: 3.10GHz and 3.11GHz
fundamental
3rd harmonic
Output level (dBm)
Input level (dBm)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-60
-50
-40
-30
-20
-10
0
10


Five Channel ADF Receiver
Test: 3rd order intercept point
Channel: 3
Frequency: 3.10GHz and 3.11GHz
+15 dBm
fundamental
3rd harmonic
Output level (dBm)
Input level (dBm)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-60
-50
-40
-30
-20
-10
0
10


+22 dBm
Five Channel ADF Receiver
Test: 3rd order intercept point
Channel: 4
Frequency: 3.10GHz and 3.11GHz
fundamental
3rd harmonic
Output level (dBm)
Input level (dBm)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-60
-50
-40
-30
-20
-10
0
10

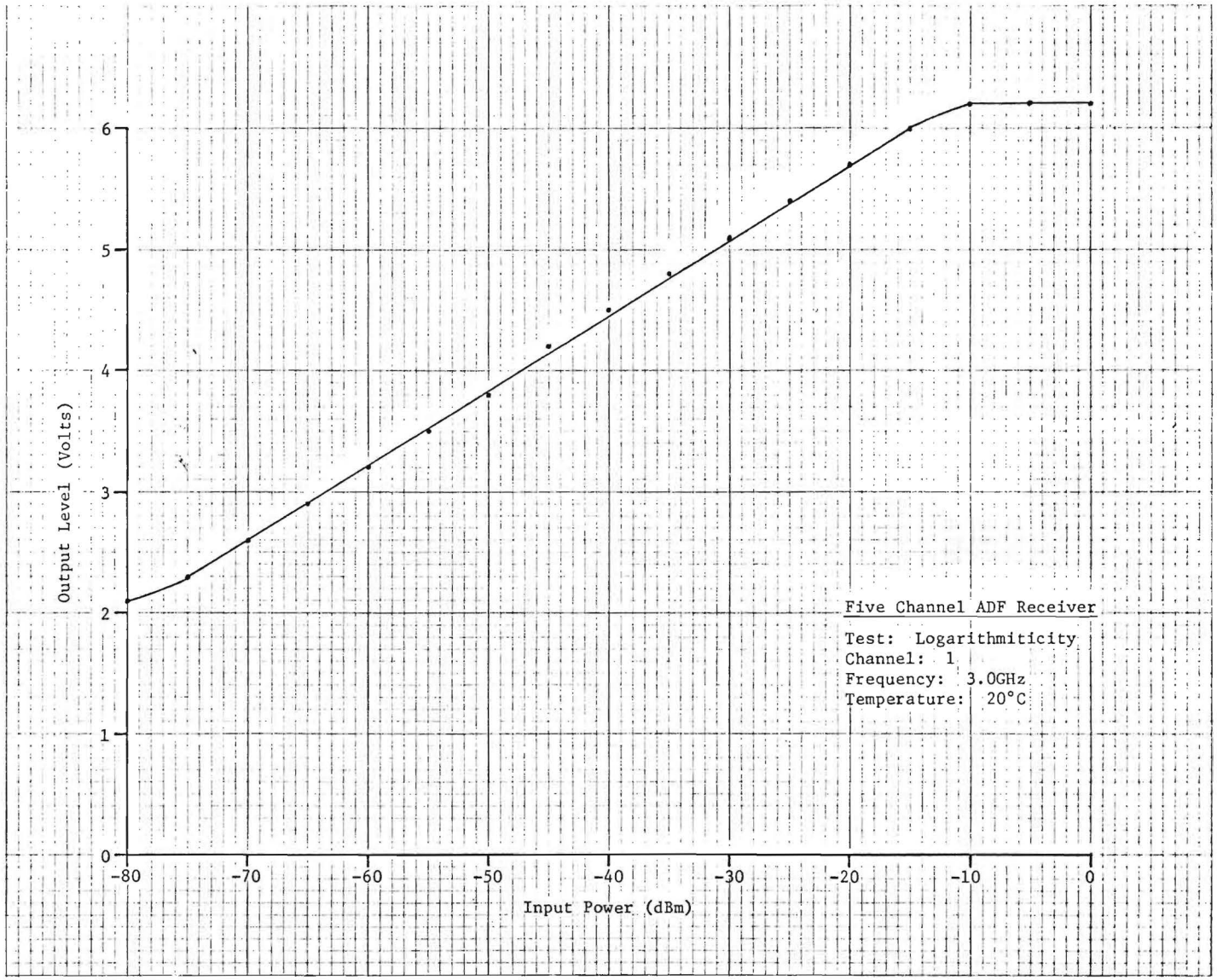

+18 dBm
Five Channel ADF Receiver
Test: 3rd order intercept point
Channel: 5
Frequency: 3.10GHz and 3.11GHz
fundamental
3rd harmonic
Output level (dBm)
Input level (dBm)
20
10
0
-10
-20
-30
-40
-50
-60
-70
-60
-50
-40
-30
-20
-10
0
10

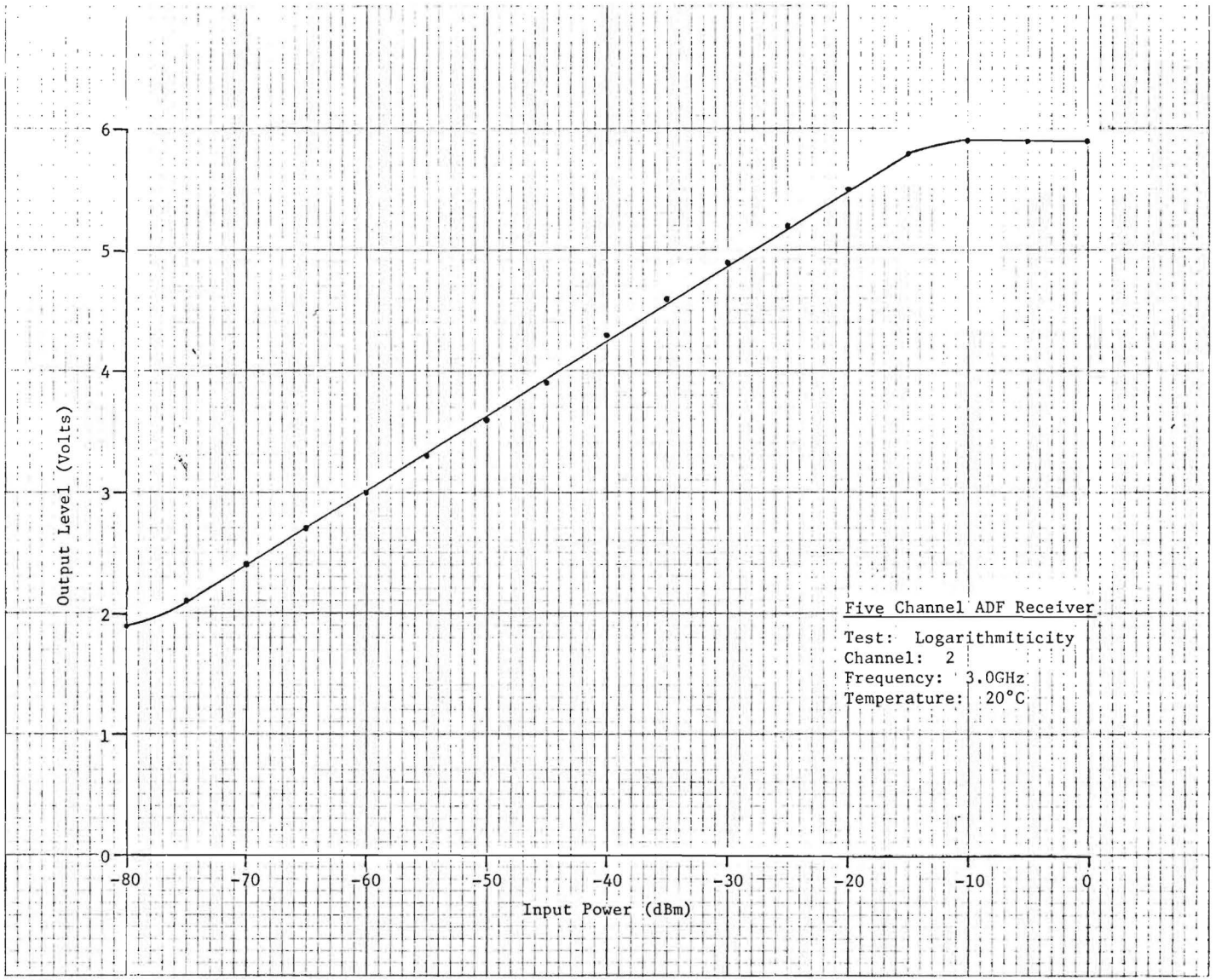
Output Signal vs. Constant Input Level of
CW and Pulsed Signals

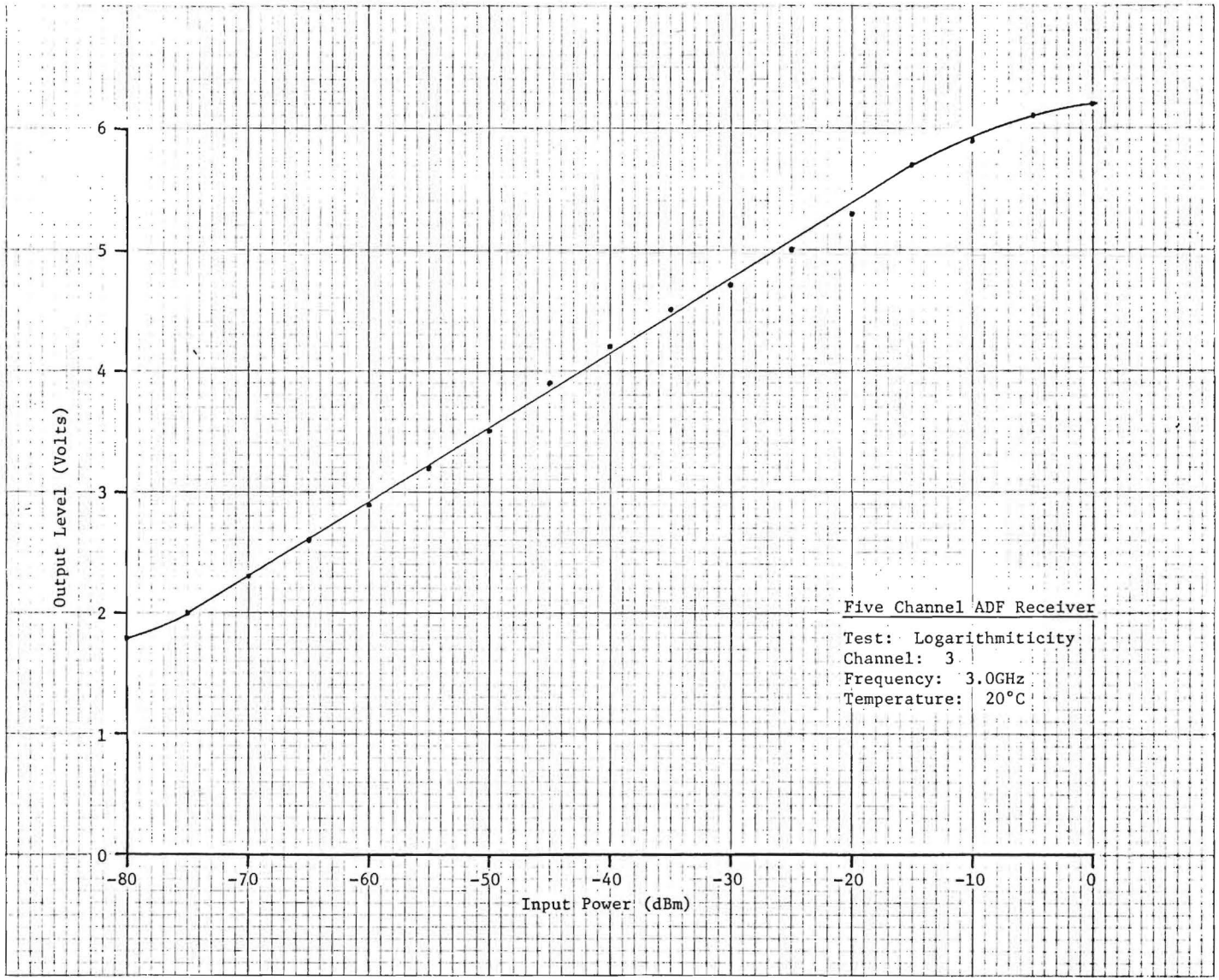
		Pulse Width (ns)				
	Channel	CW	2	1	0.5	0.25
Frequency: 14.0 GHz	1	6.3V	6.2V	6.3V	6.3V	6.4V
	2	6.0	5.9	6.0	6.0	6.1
	3	6.3	6.2	6.3	6.3	6.4
	4	6.0	5.9	6.0	6.0	5.9
	5	5.6	5.5	5.6	5.6	5.7
Frequency: 9.3 GHz	1	6.2V	6.1V	6.2V	6.2V	6.3V
	2	5.9	5.8	5.9	5.9	6.0
	3	6.2	6.1	6.2	6.2	6.3
	4	5.9	5.8	5.9	5.9	6.0
	5	5.6	5.5	5.6	5.6	5.7
Frequency: 3.1 GHz	1	6.6V	6.5V	6.6V	6.6V	6.7V
	2	6.2	6.1	6.2	6.2	6.3
	3	6.3	6.2	6.3	6.3	6.4
	4	6.2	6.1	6.2	6.2	6.3
	5	5.5	5.4	5.5	5.5	5.6

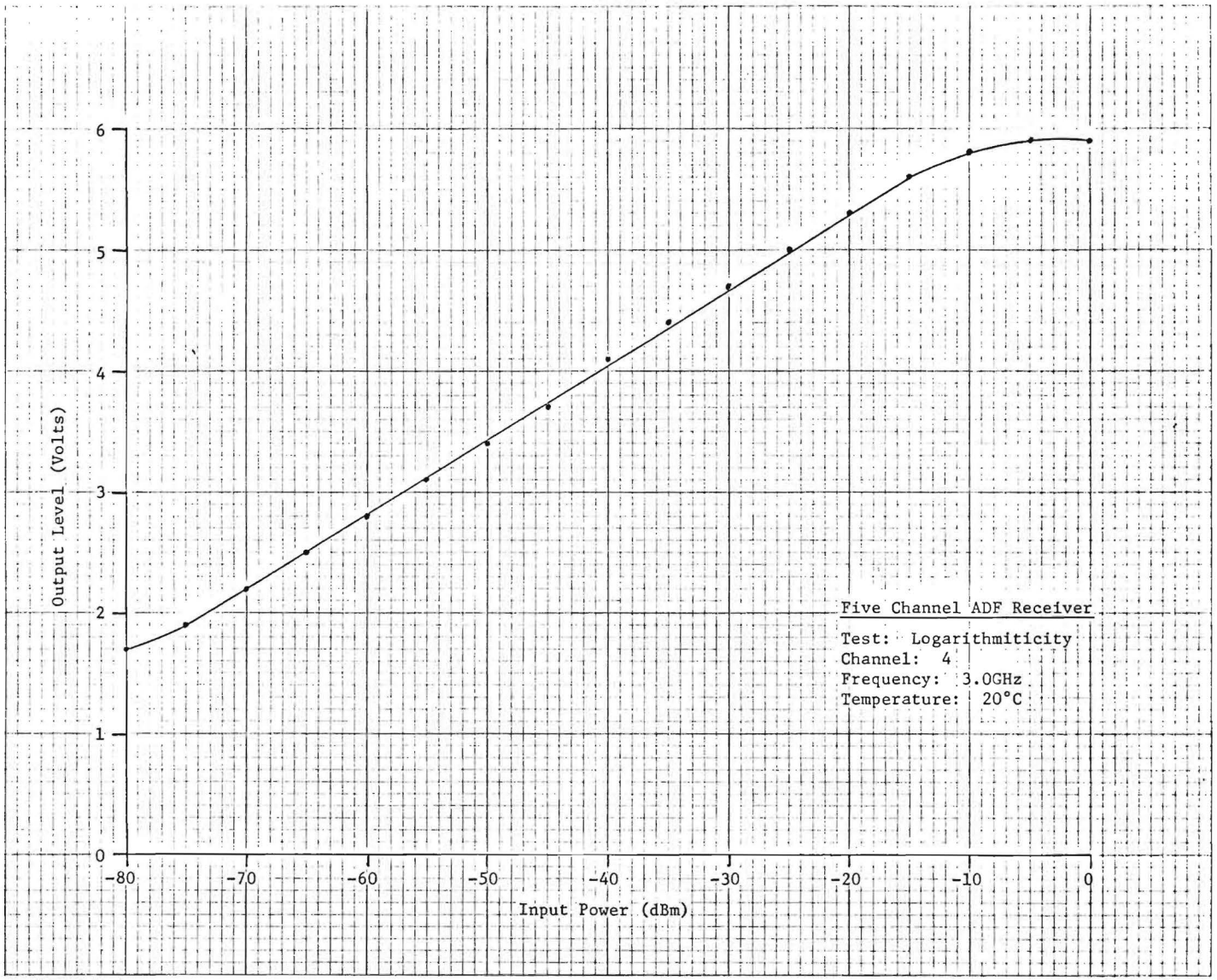
Five Channel ADF Receiver
Tangential Sensitivity vs. Frequency

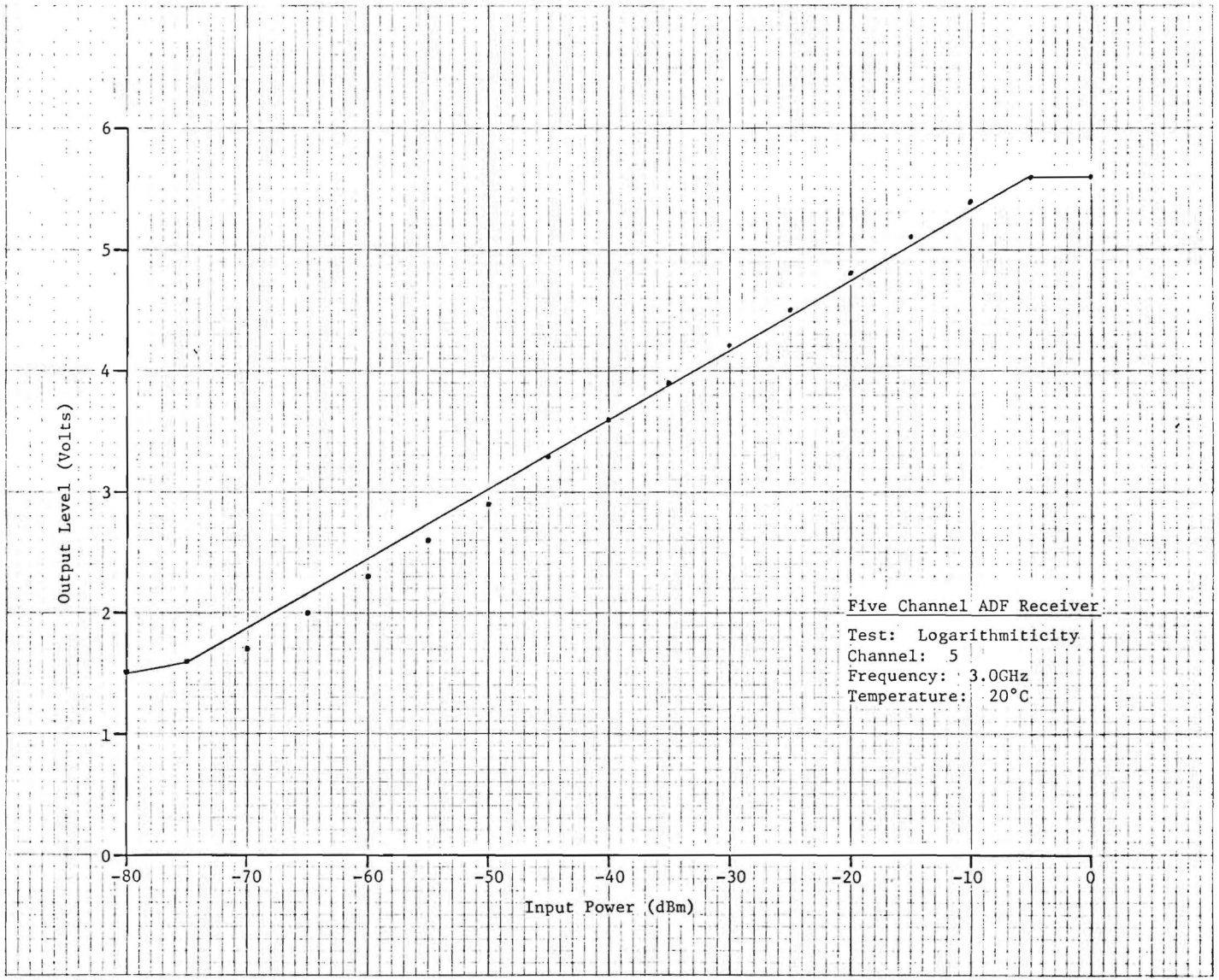
	Frequency (GHz)		
Channel	3.0	9.3	14.0
1	-80 dBm	-77 dBm	-78 dBm
2	-80	-77	-78
3	-79	-75	-76
4	-77	-77	-76
5	-78	-72	-73

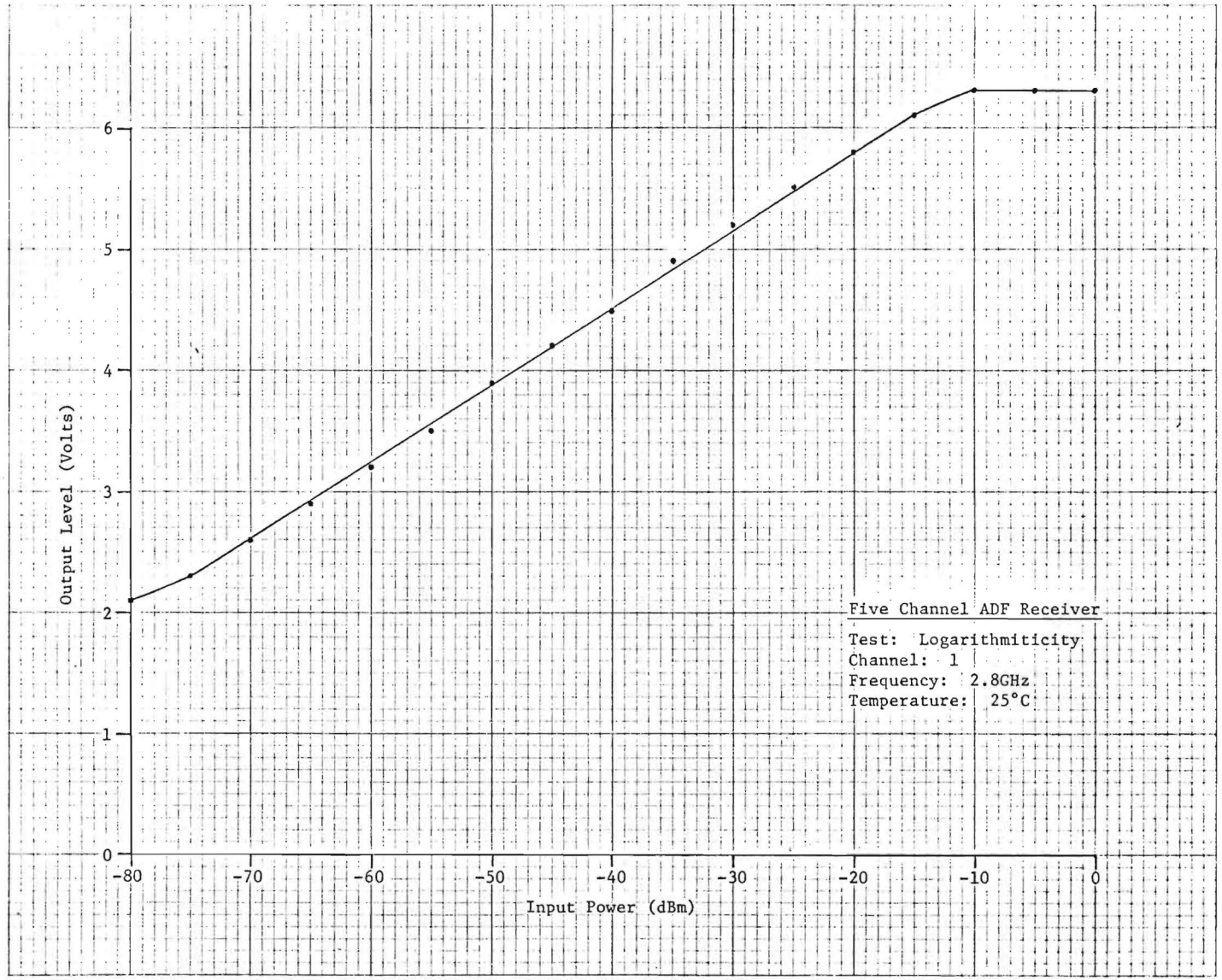

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 3.0GHz
Temperature: 20°C

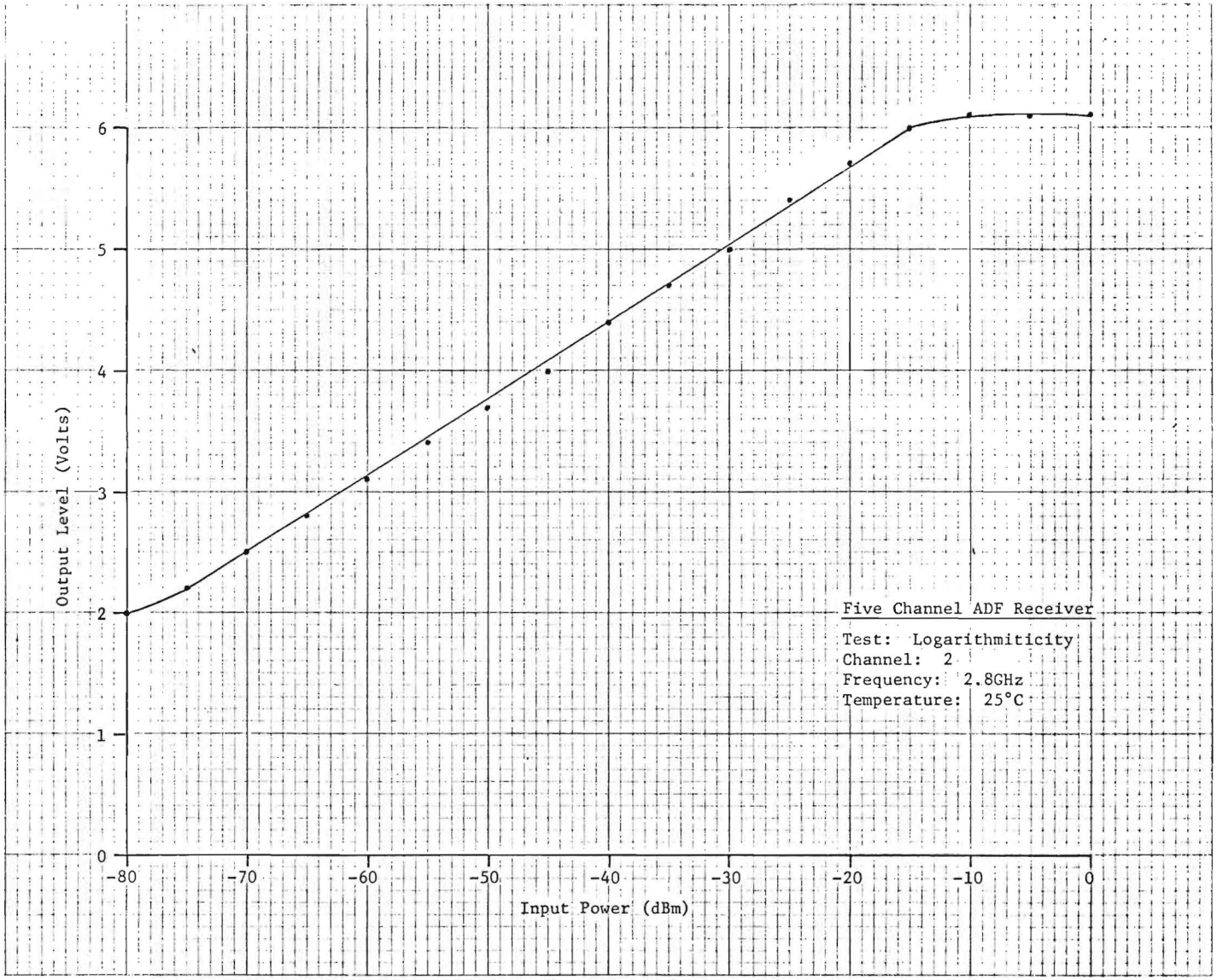

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 3.0GHz
Temperature: 20°C

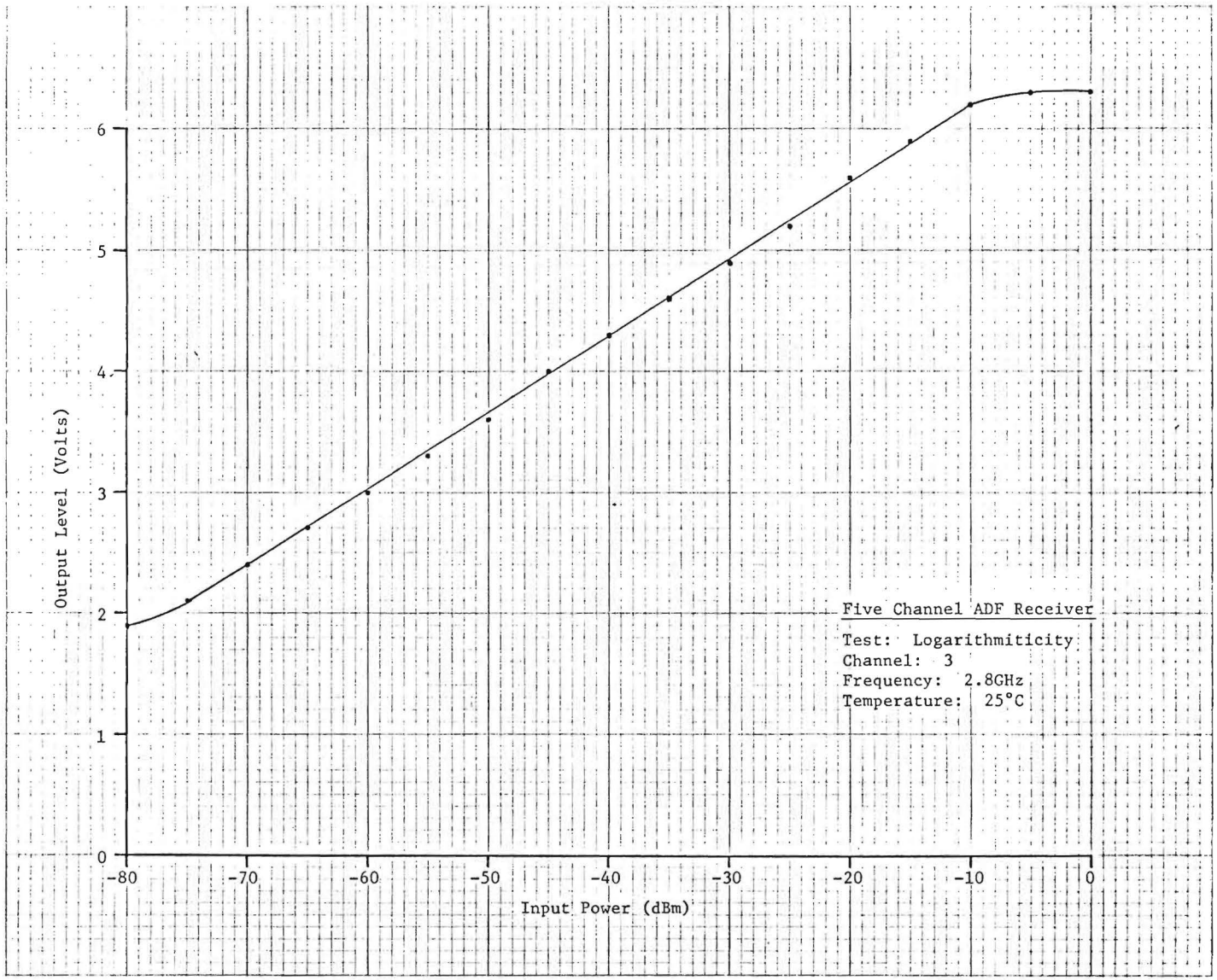

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 3.0GHz
Temperature: 20°C

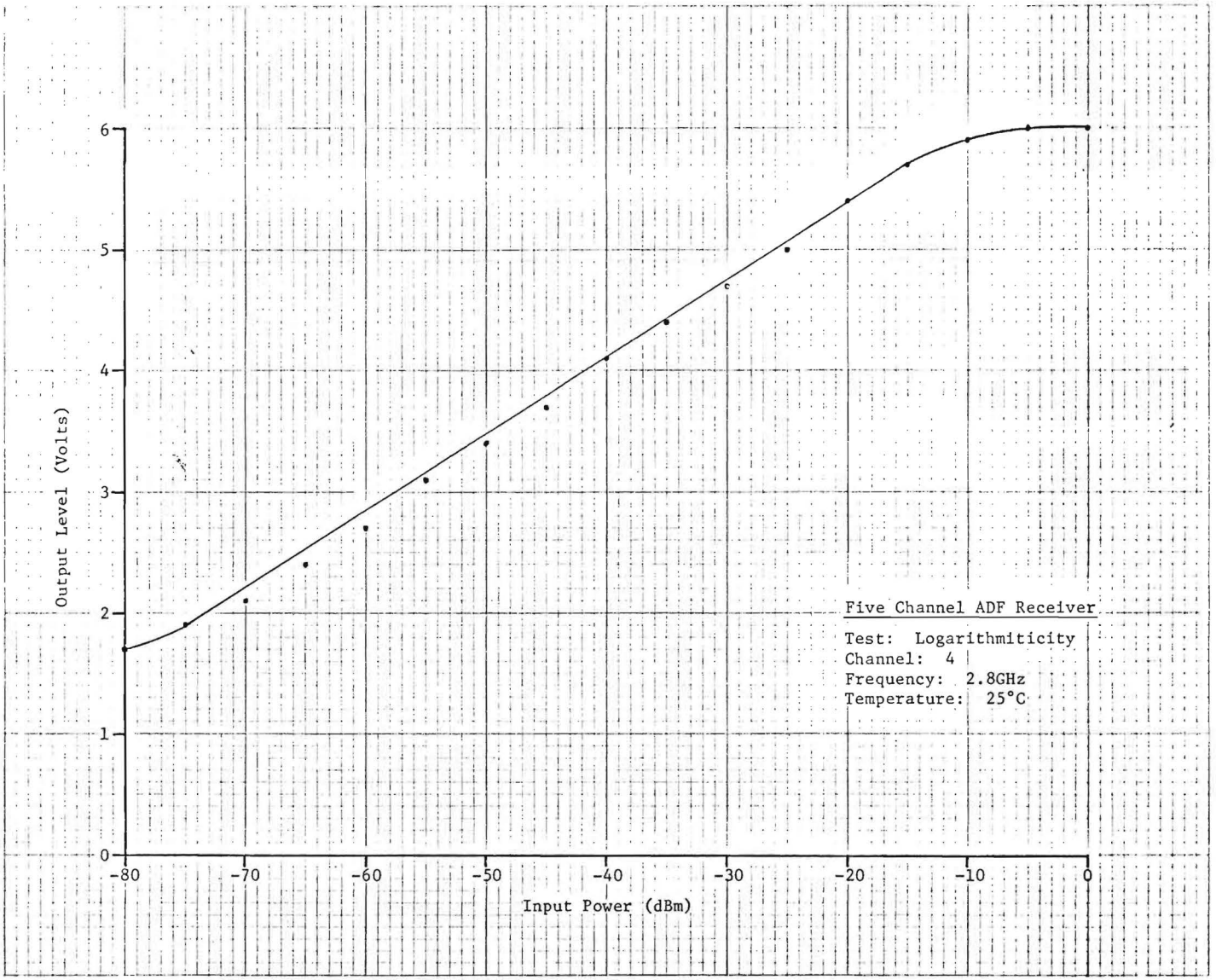

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 3.0GHz
Temperature: 20°C

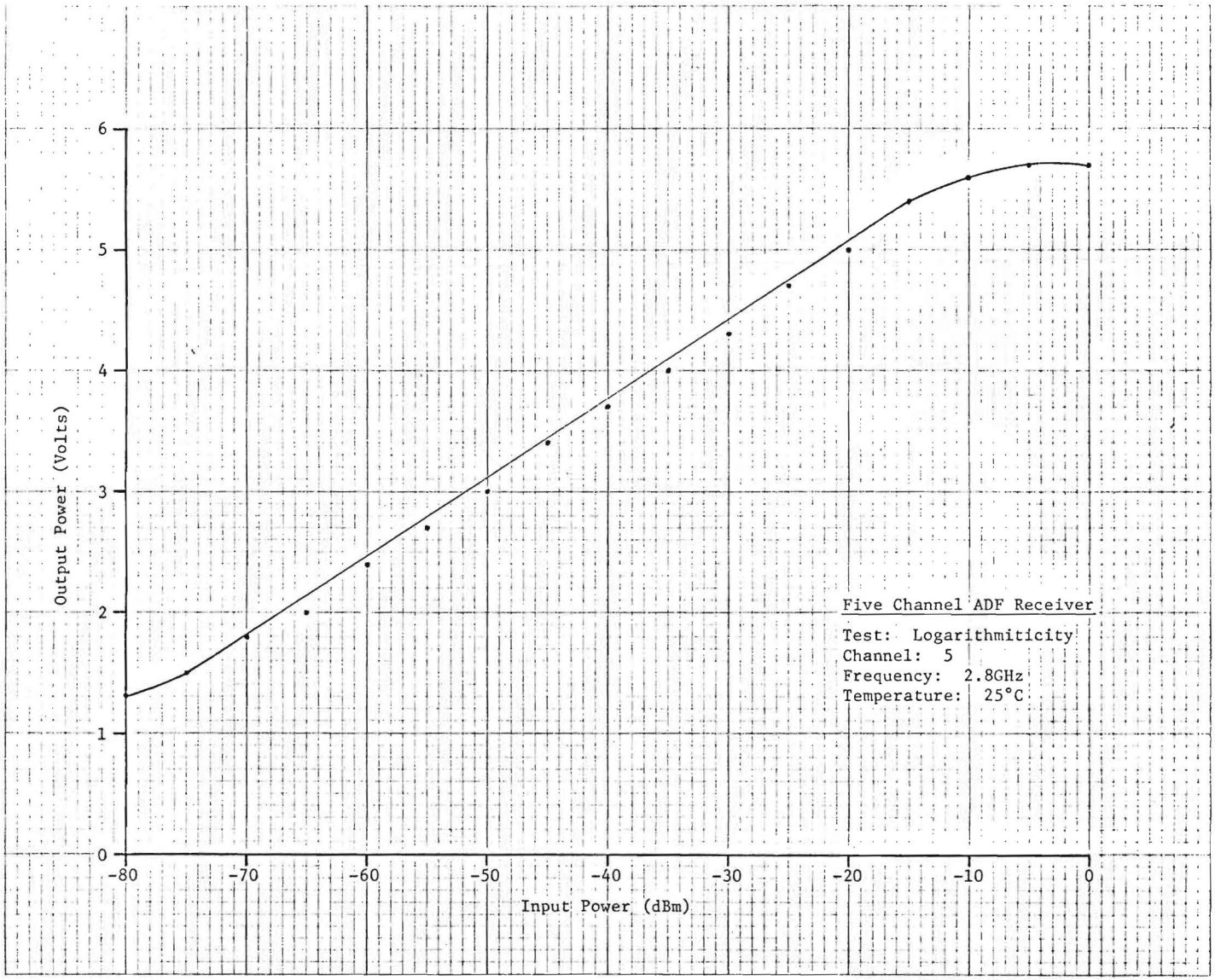

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 3.0GHz
Temperature: 20°C

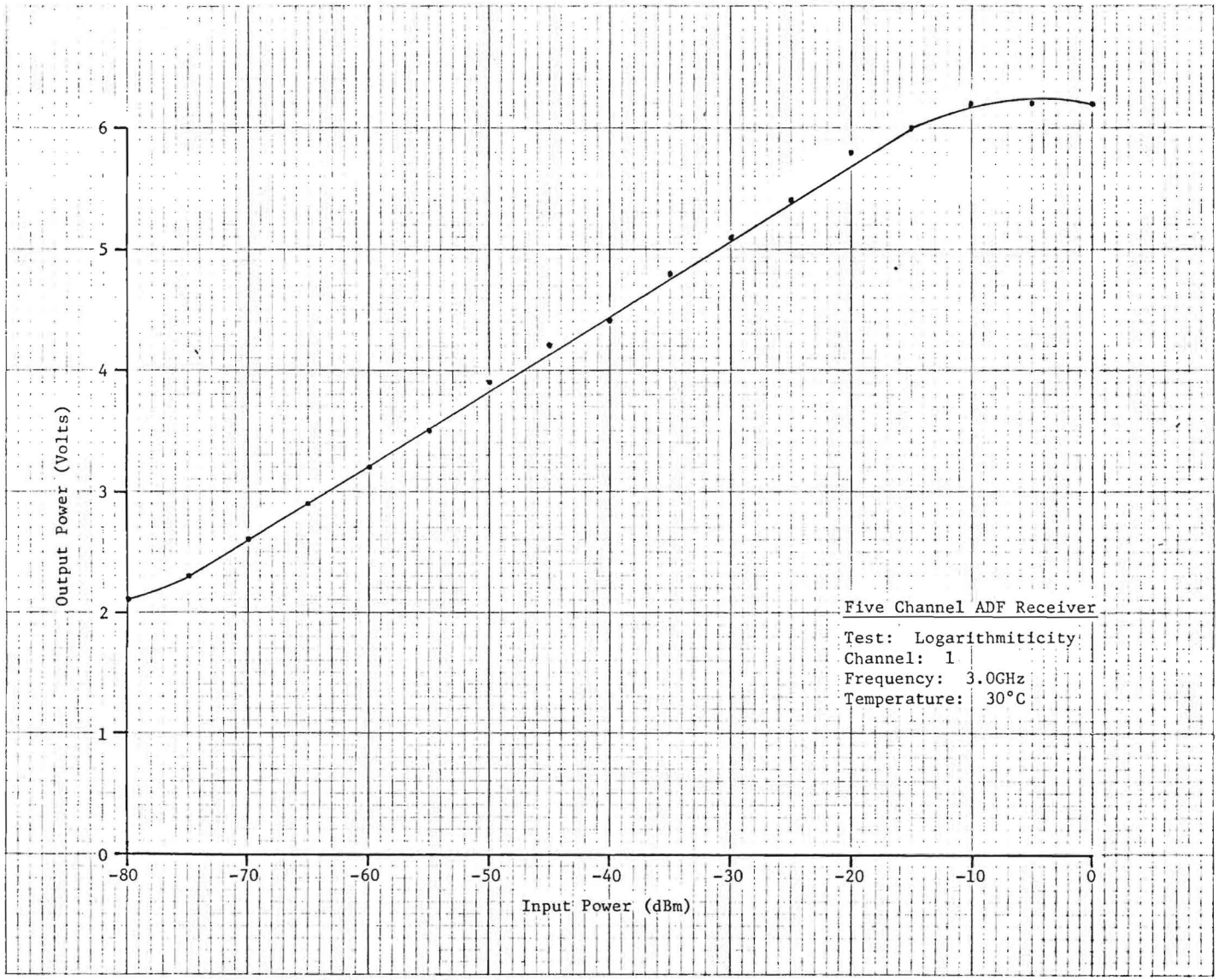

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 2.8GHz
Temperature: 25°C

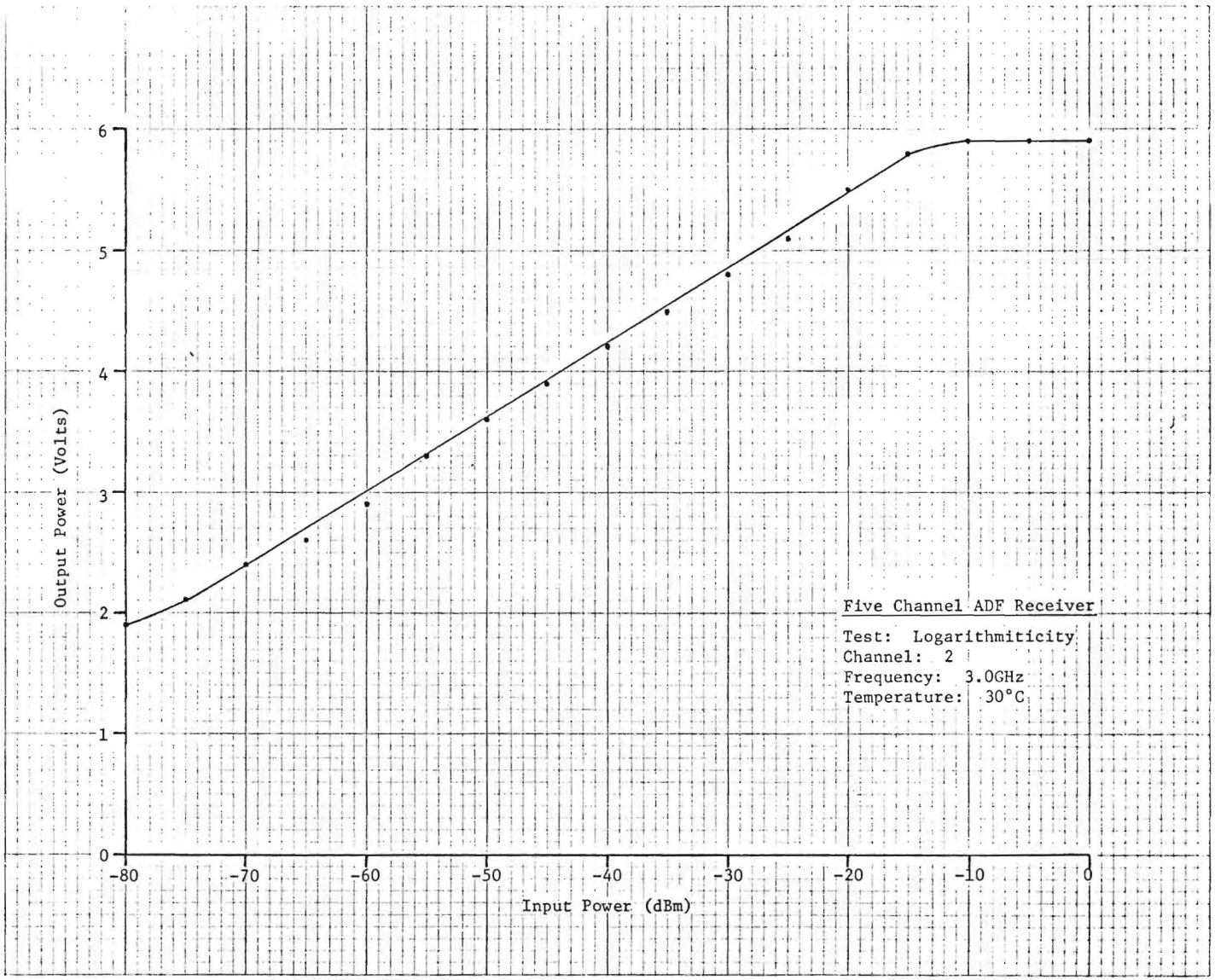

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 2.8GHz
Temperature: 25°C

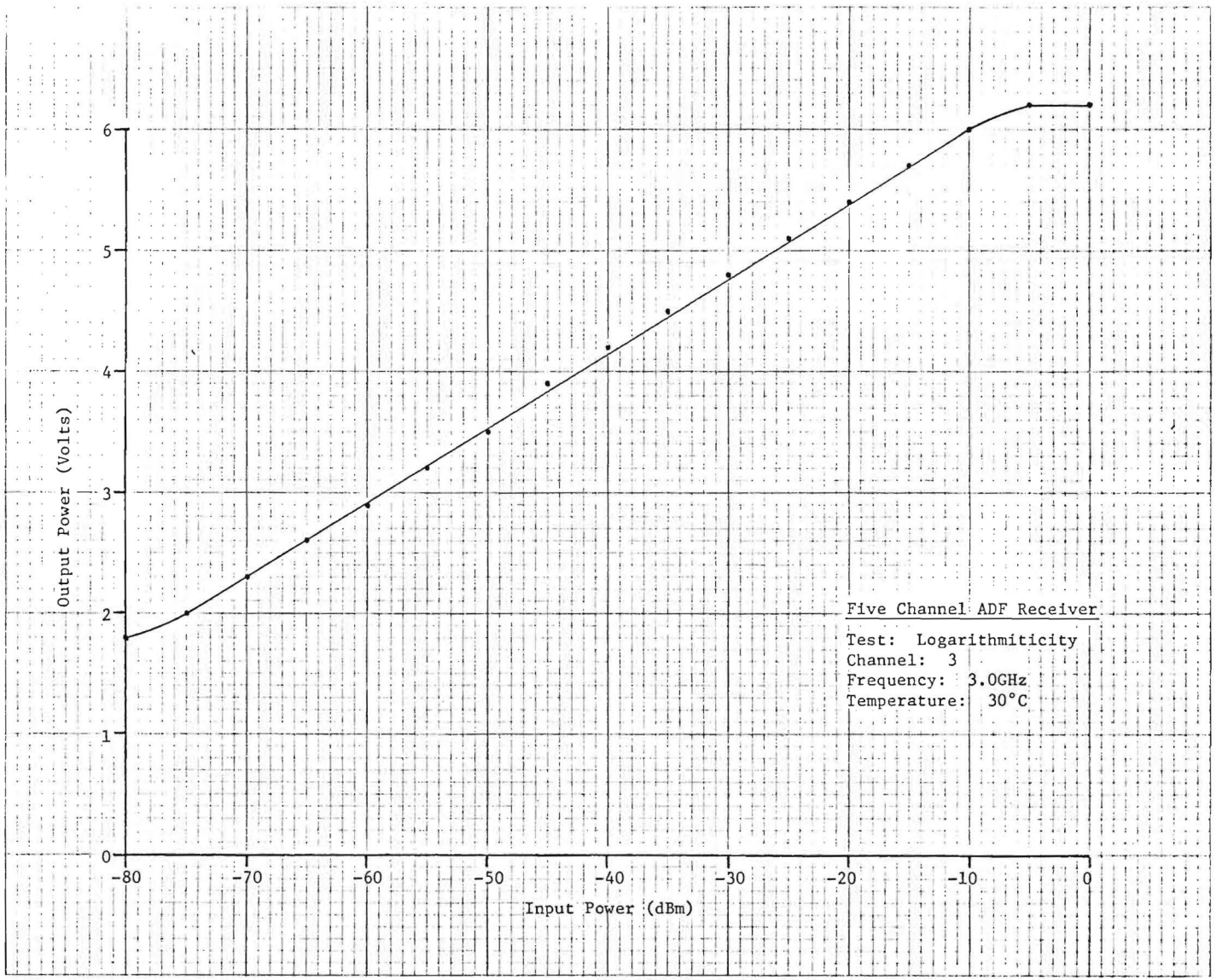

Output Level (Volts)
0
1
2
3
4
5
6
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 2.8GHz
Temperature: 25°C

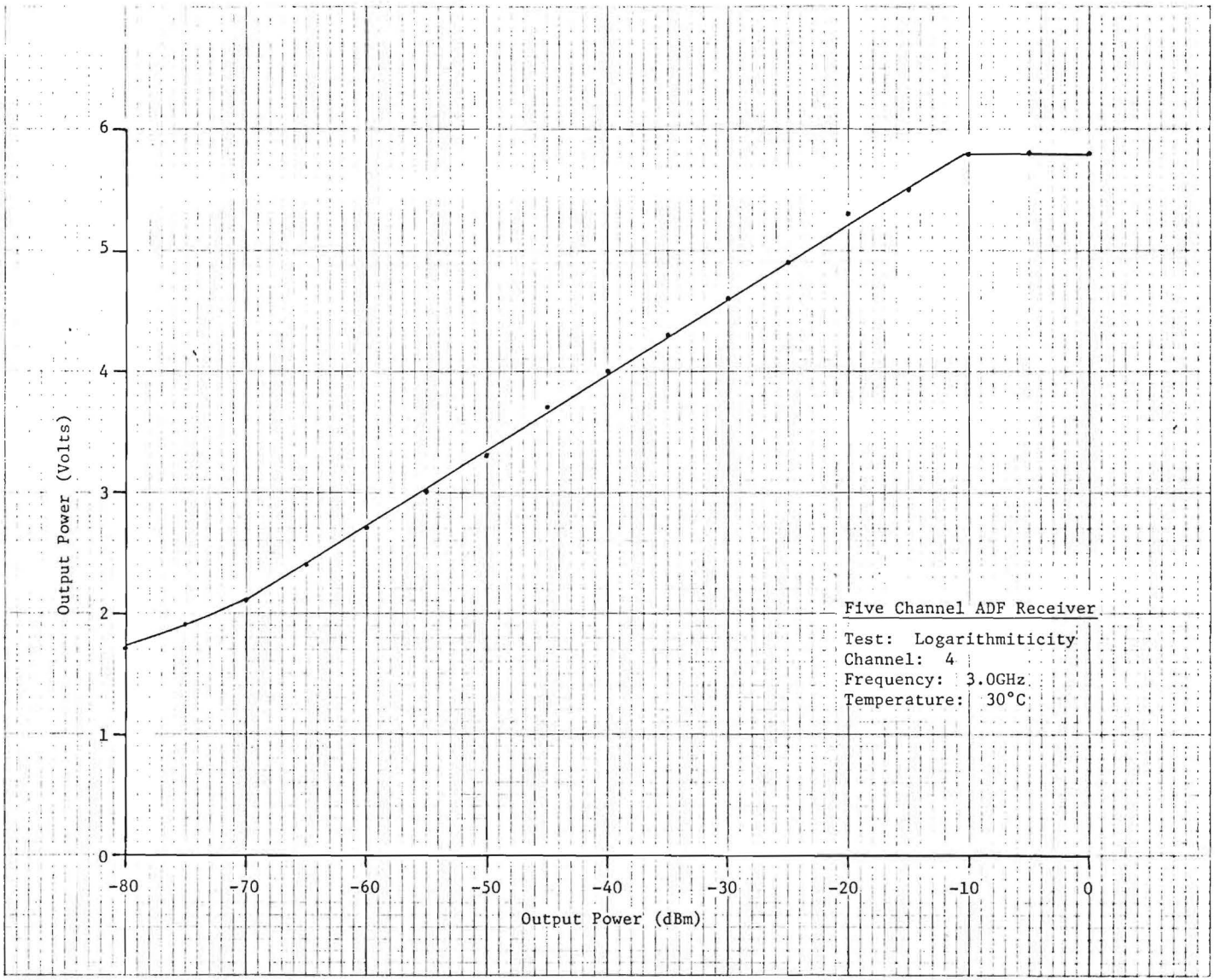

Output Level (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 2.8GHz
Temperature: 25°C

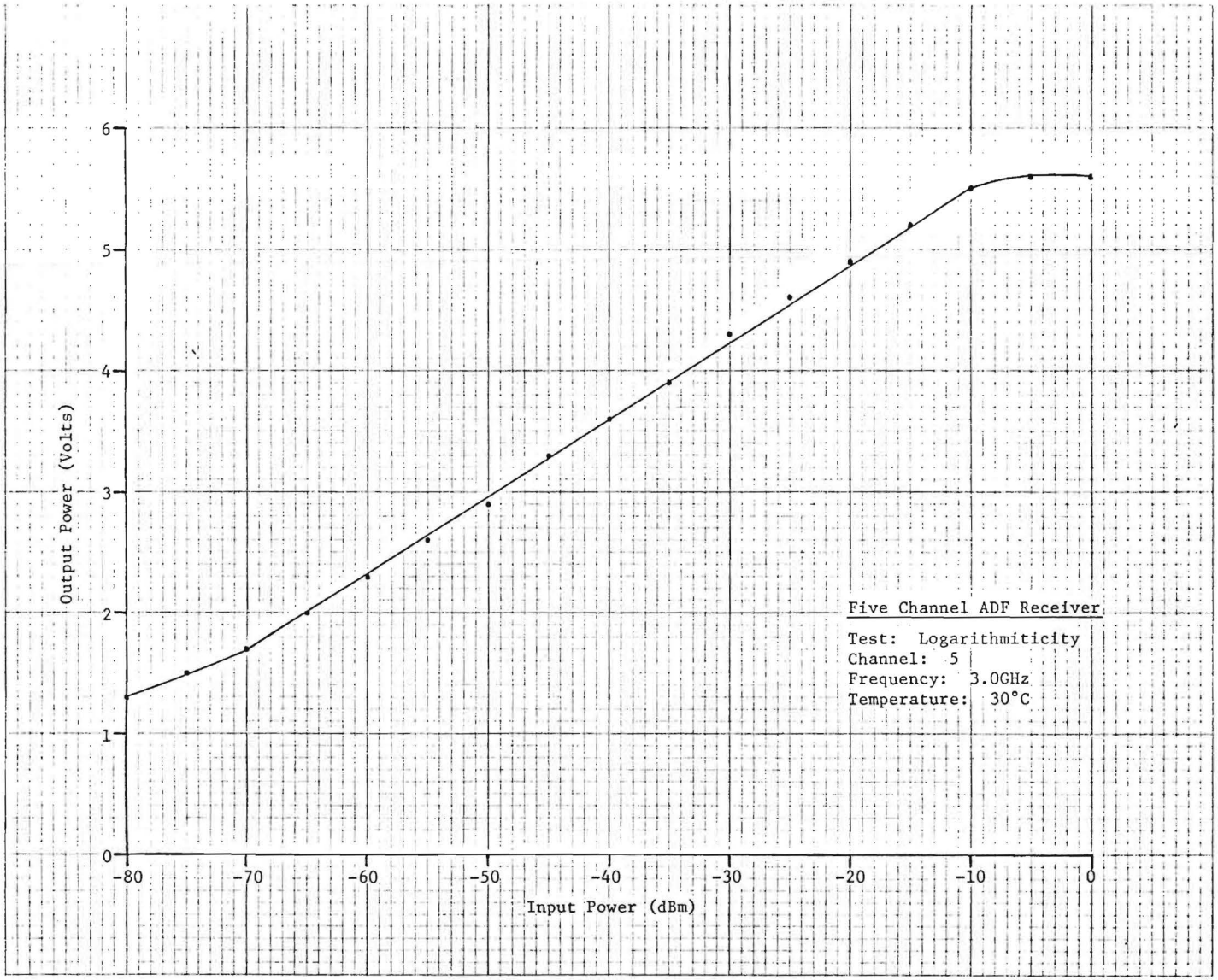

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 2.8GHz
Temperature: 25°C

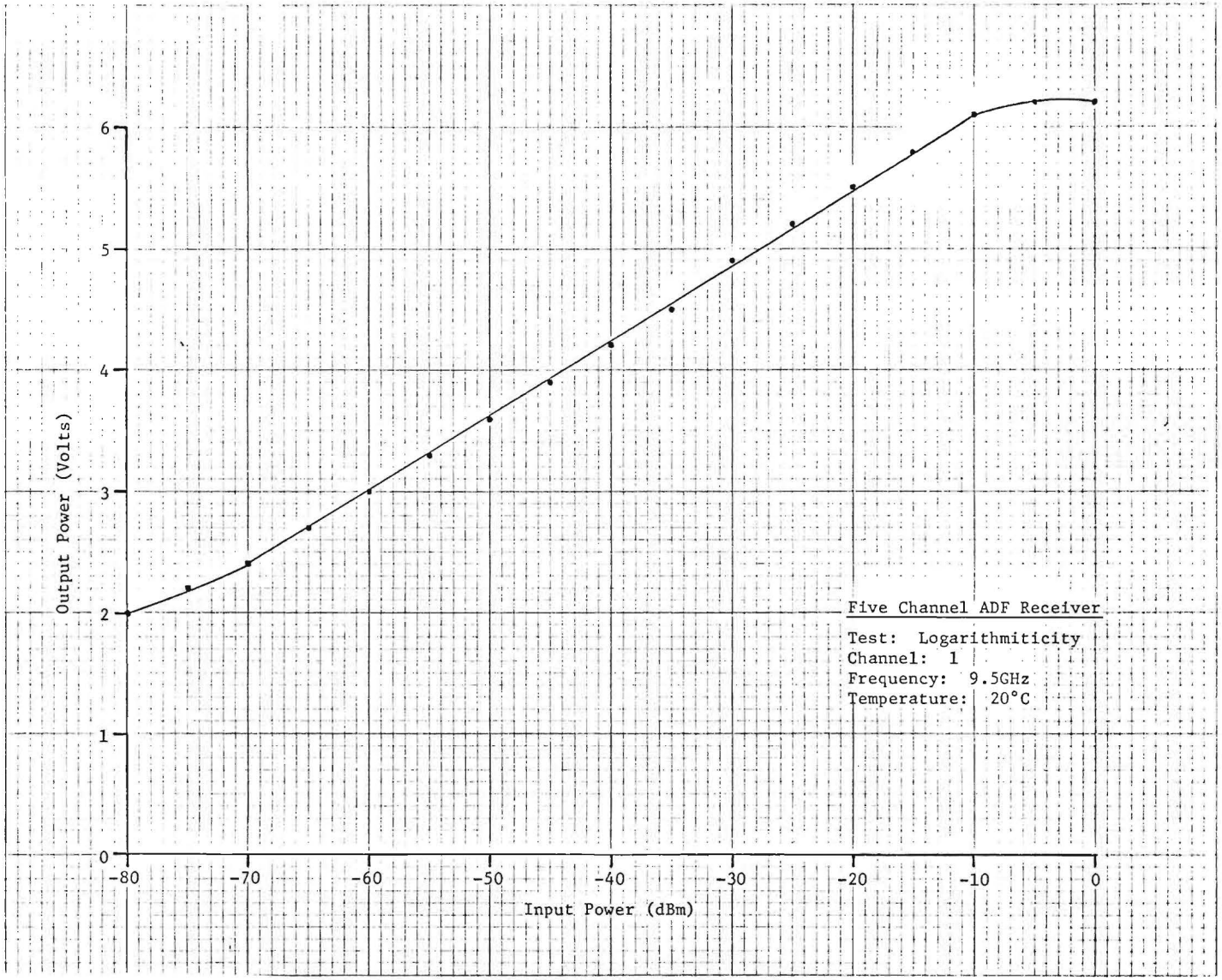

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 3.0GHz
Temperature: 30°C

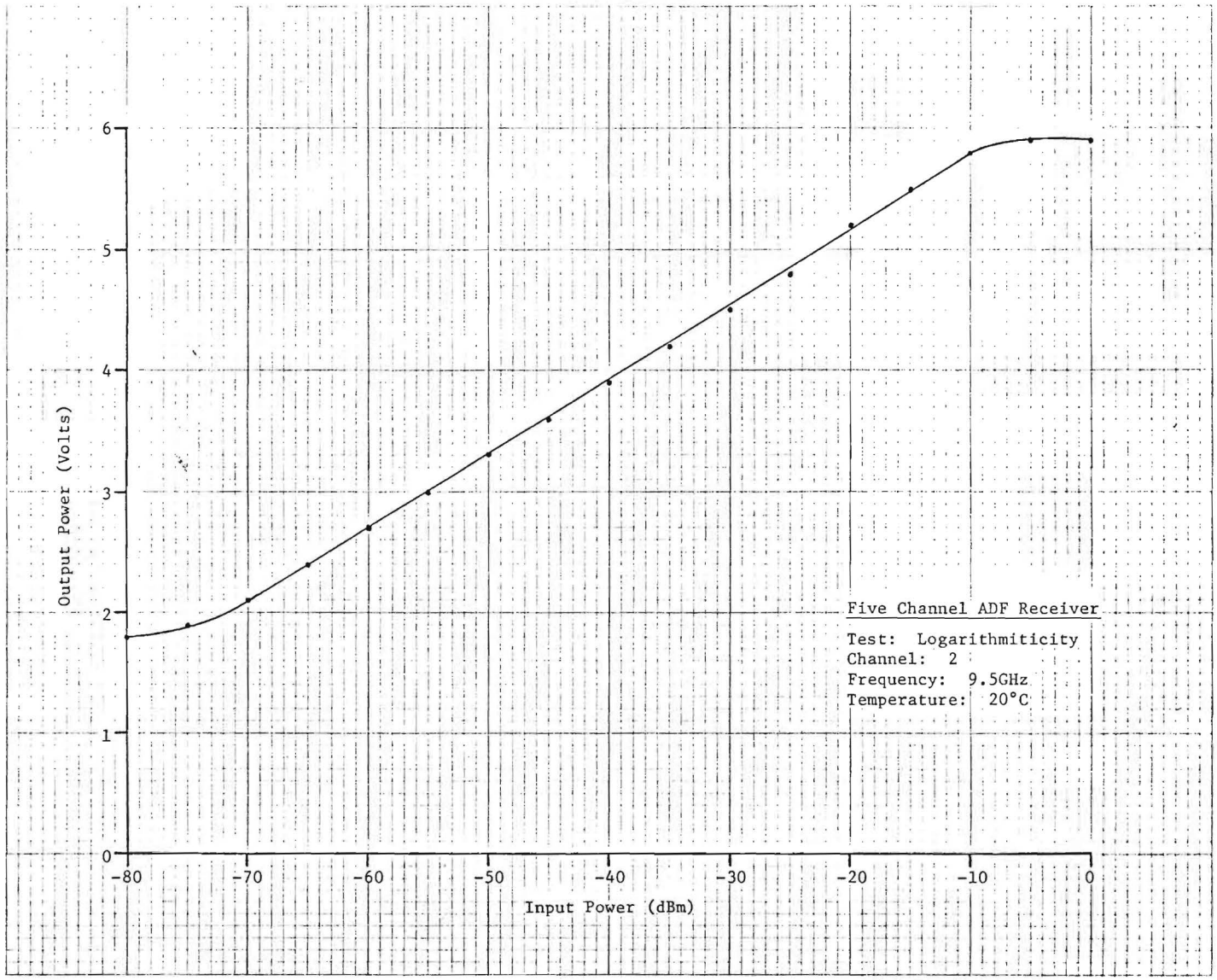

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 3.0GHz
Temperature: 30°C

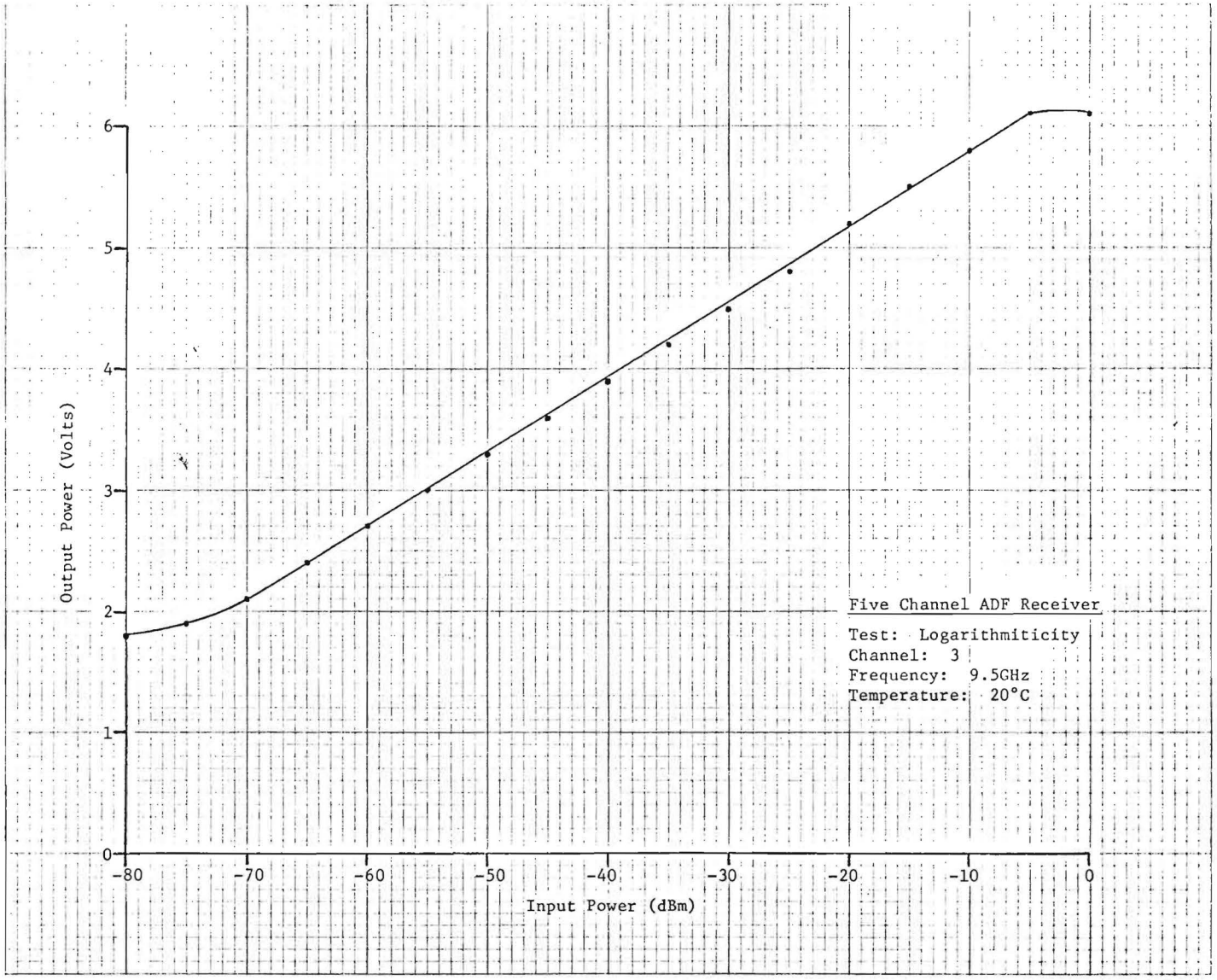

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 3.0GHz
Temperature: 30°C

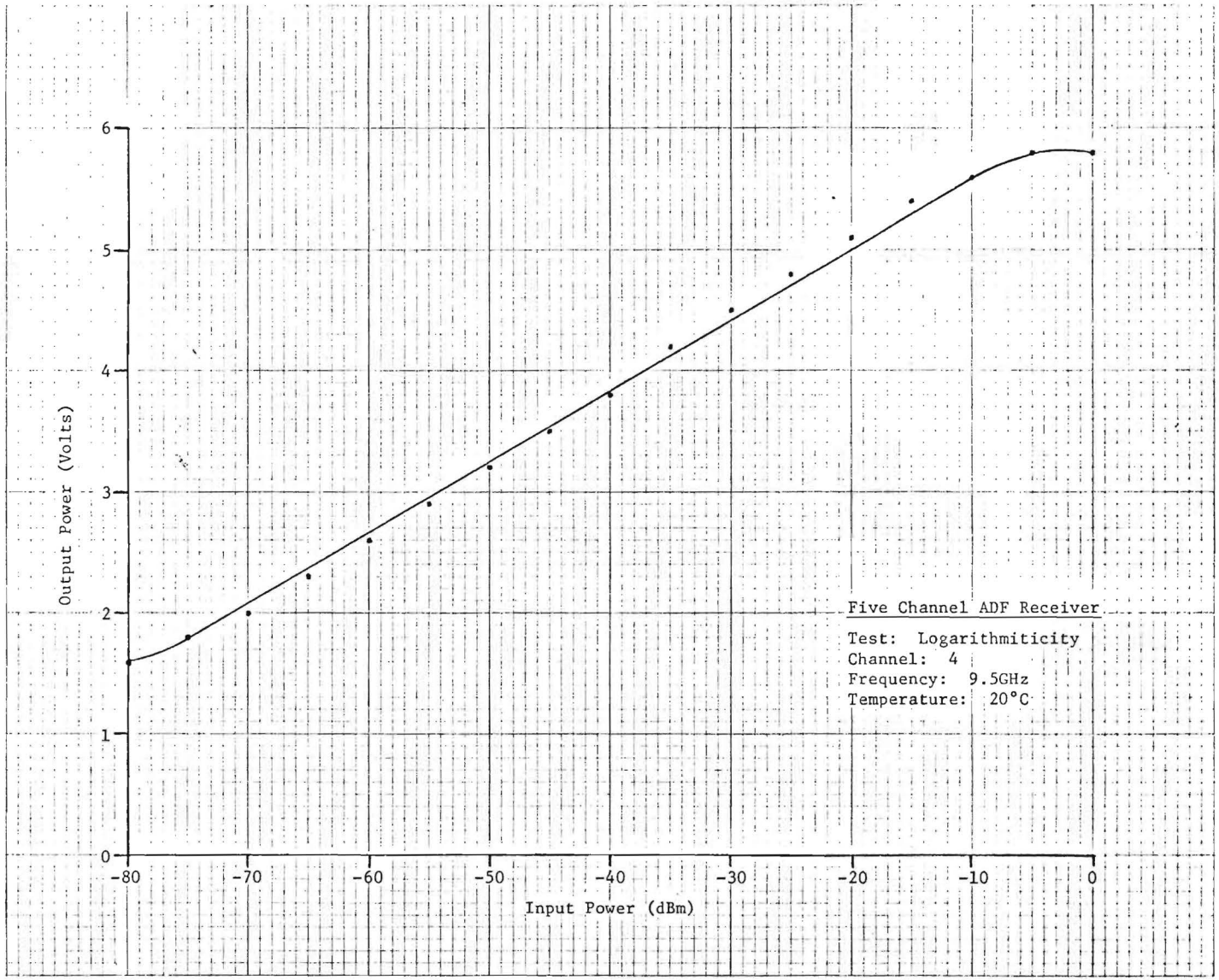

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Output Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 3.0GHz
Temperature: 30°C

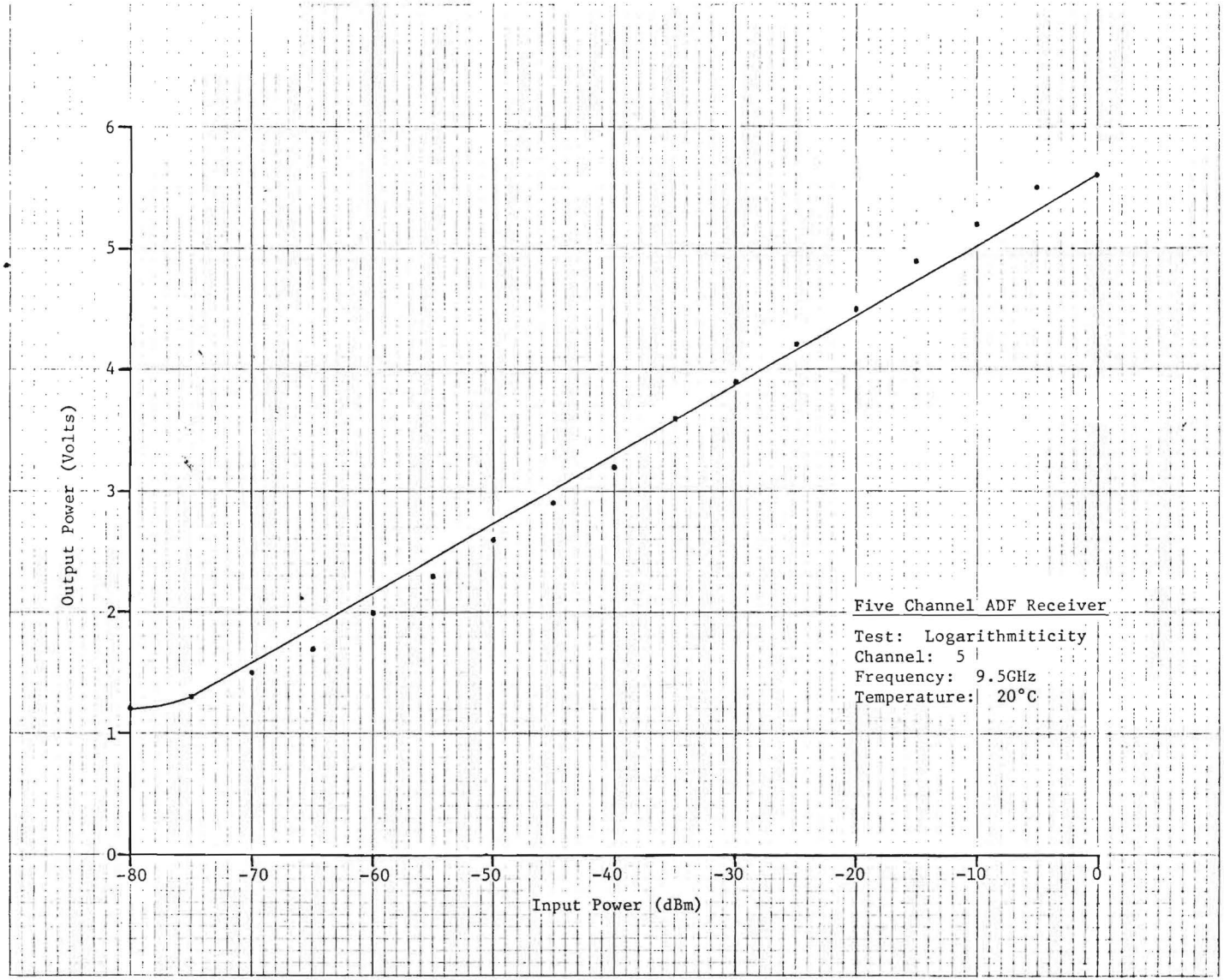

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 3.0GHz
Temperature: 30°C

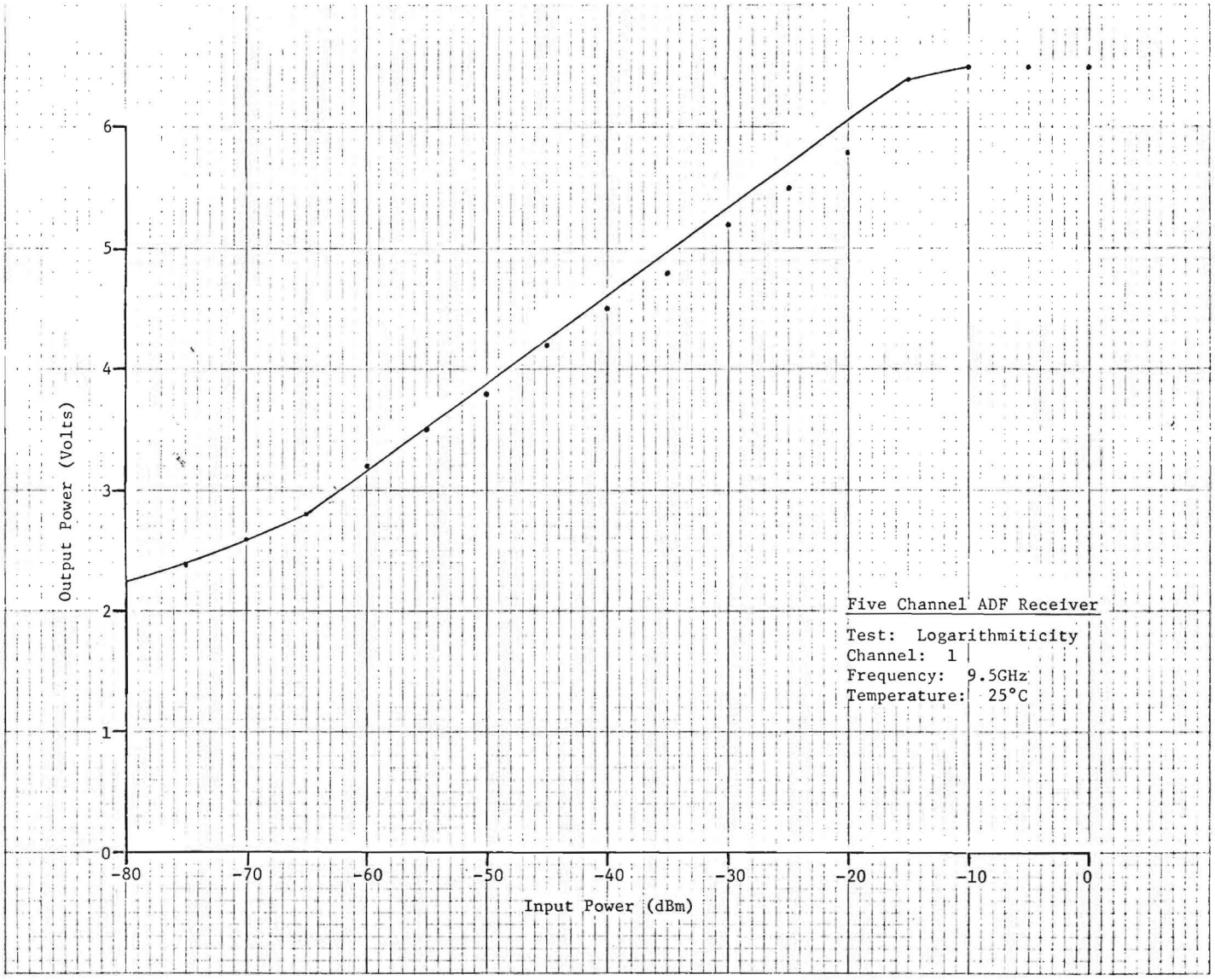

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 9.5GHz
Temperature: 20°C

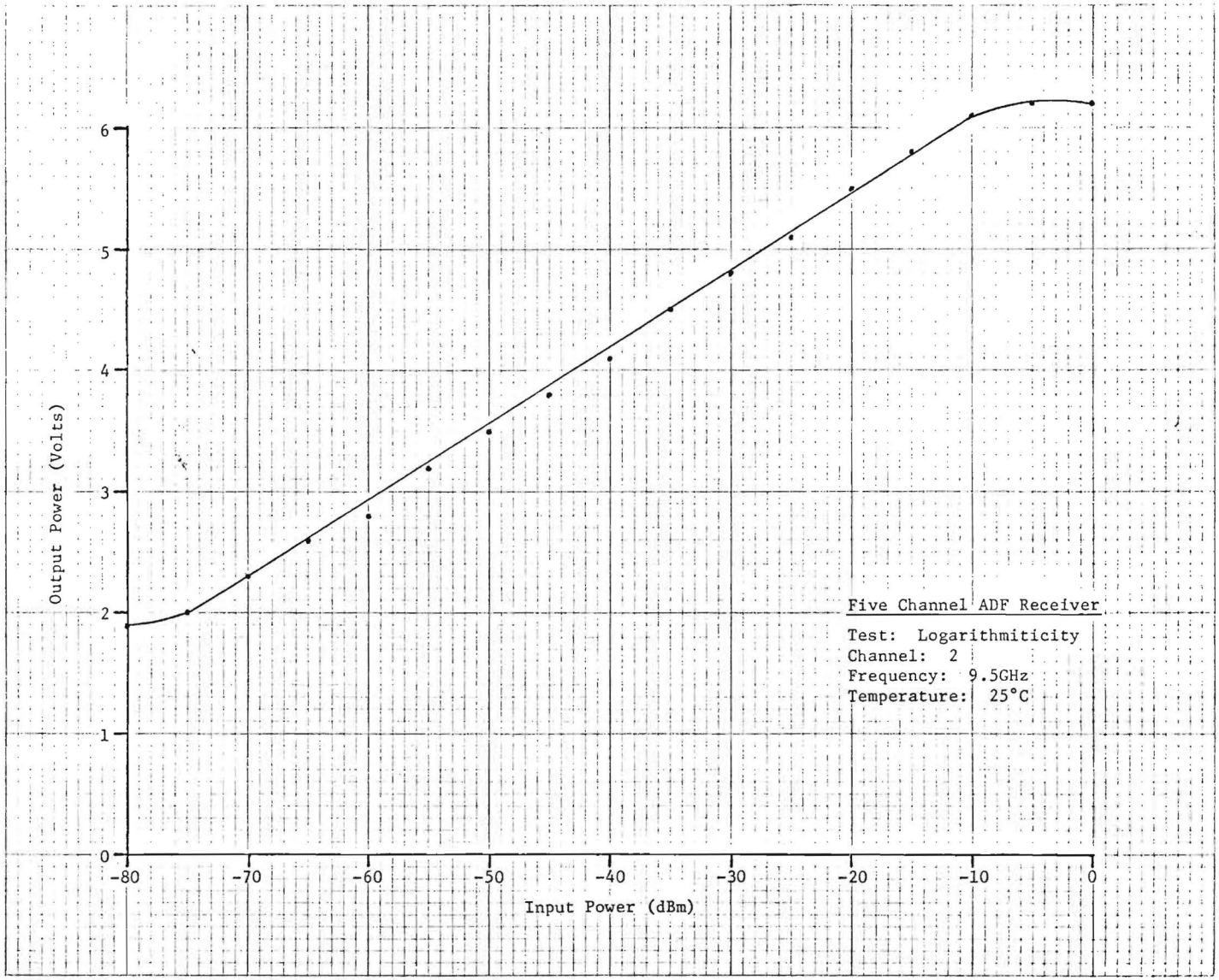

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 9.5GHz
Temperature: 20°C

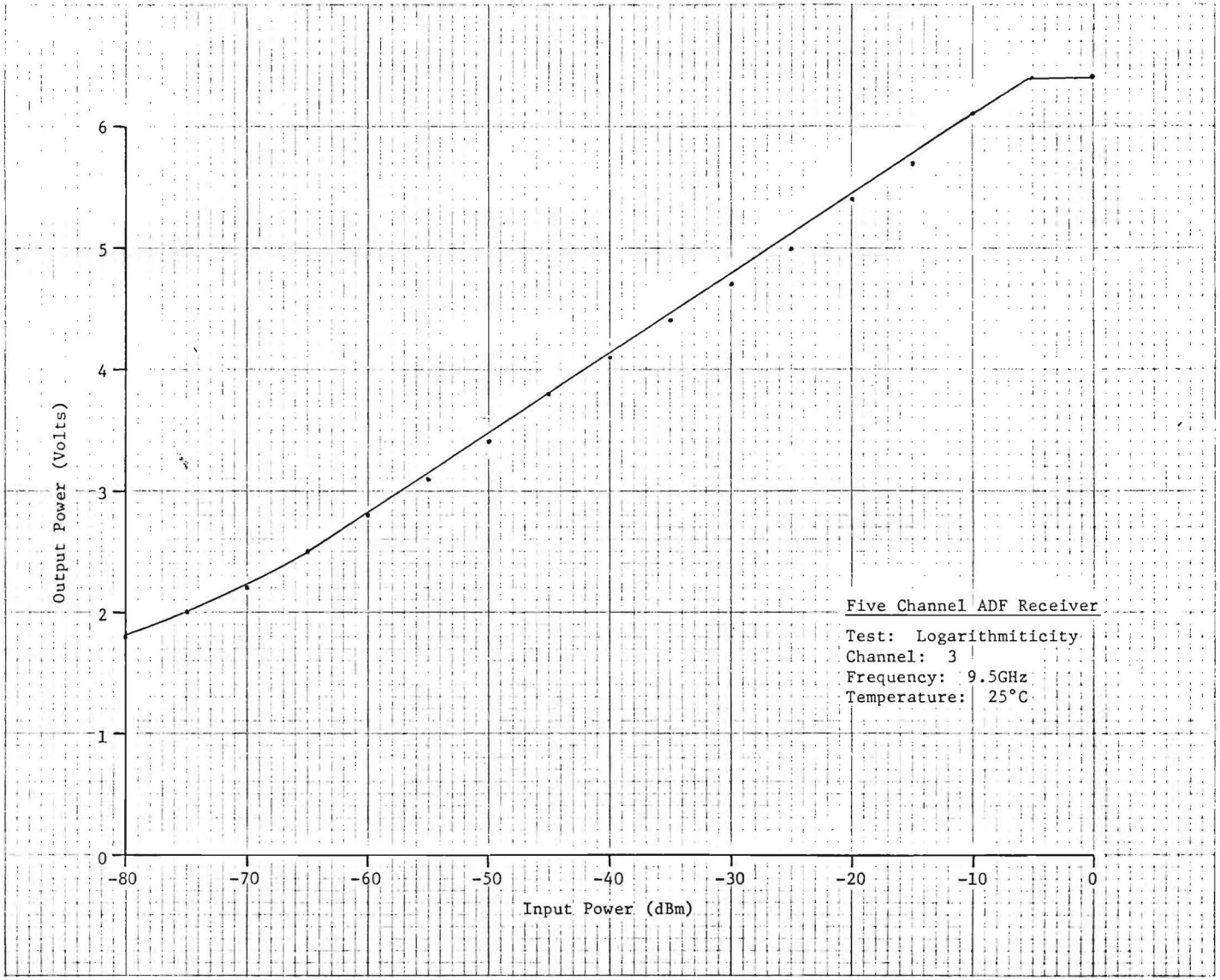

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 9.5GHz
Temperature: 20°C

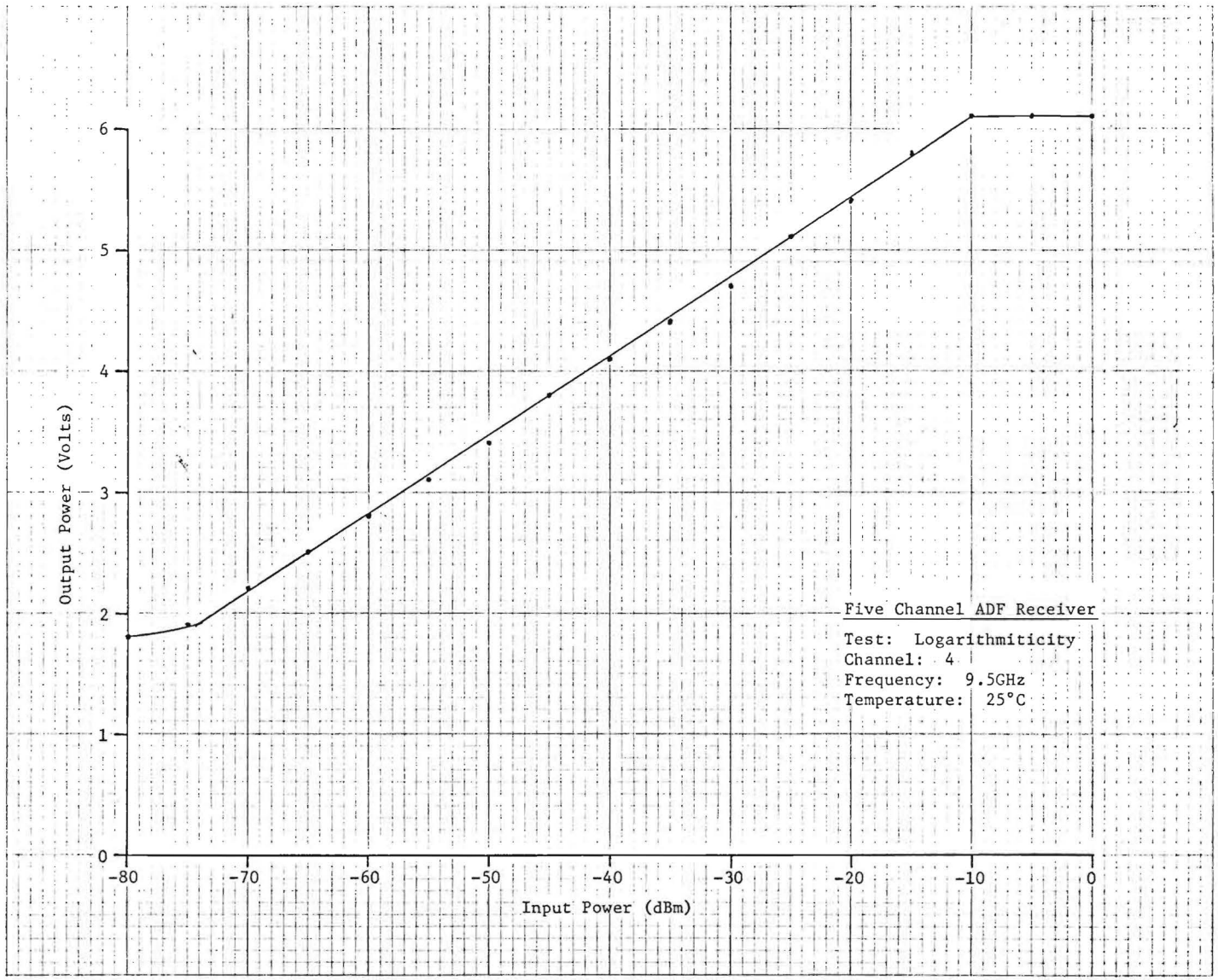

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 9.5GHz
Temperature: 20°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 9.5GHz
Temperature: 20°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 9.5GHz
Temperature: 25°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 9.5GHz
Temperature: 25°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 9.5GHz
Temperature: 25°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
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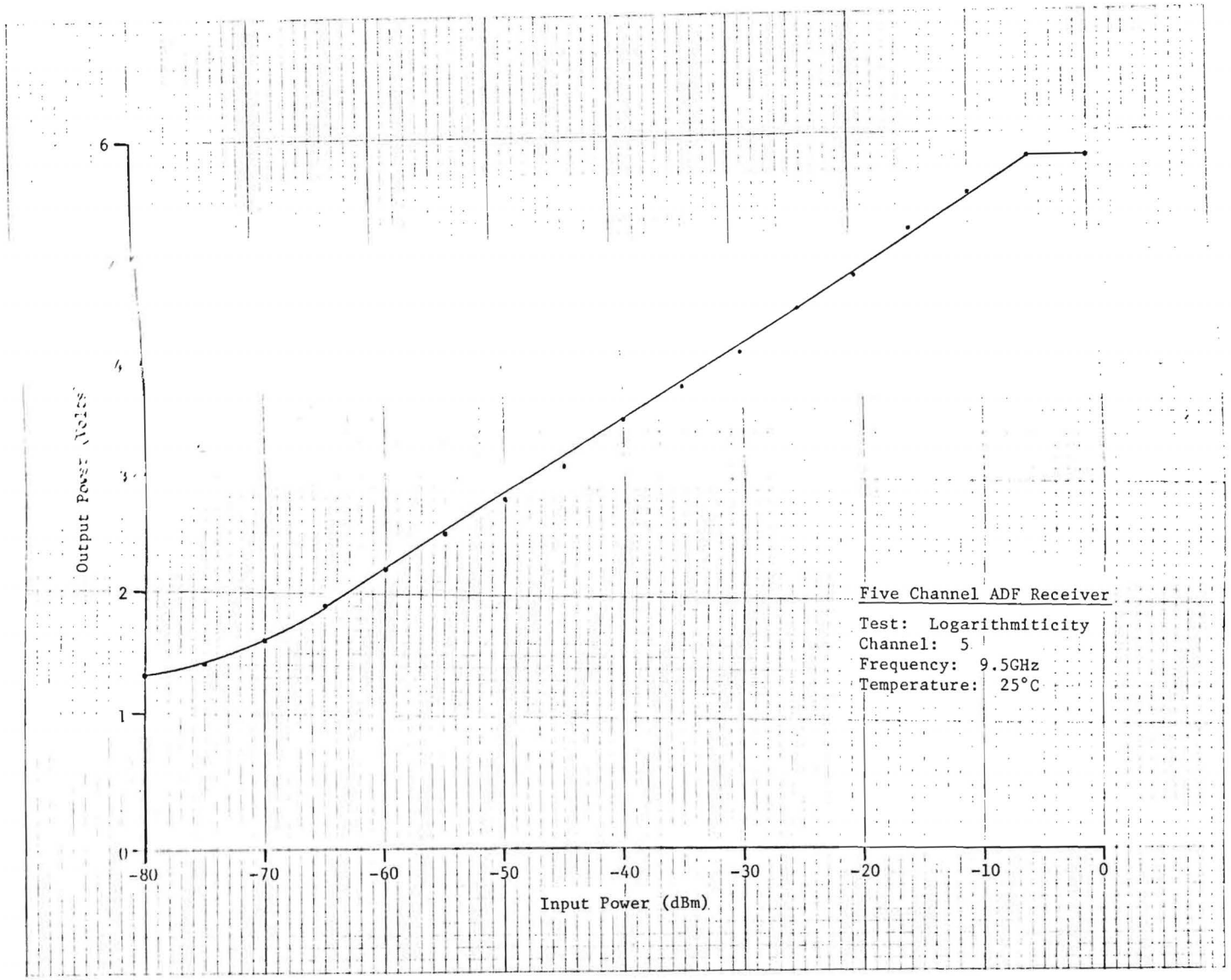
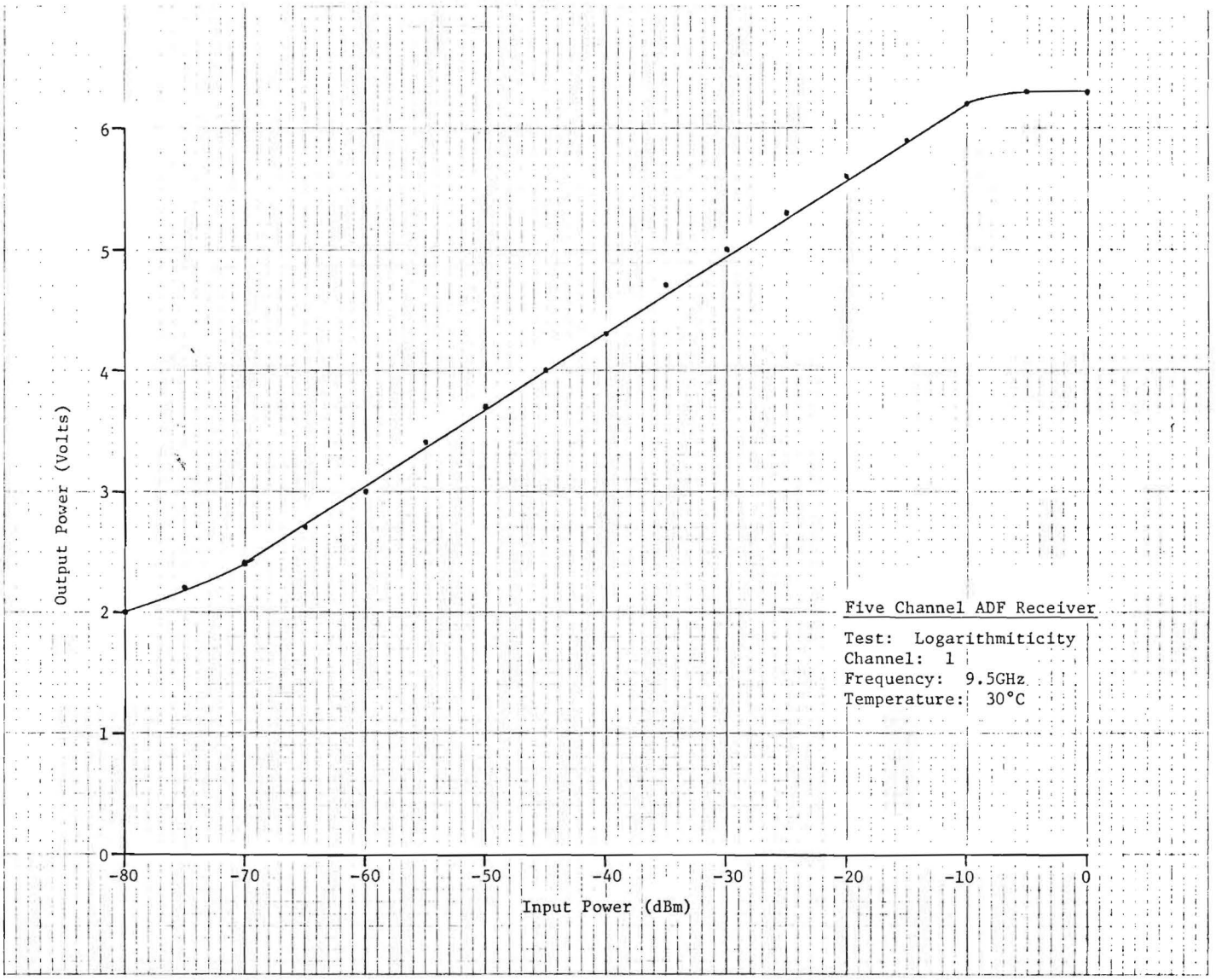
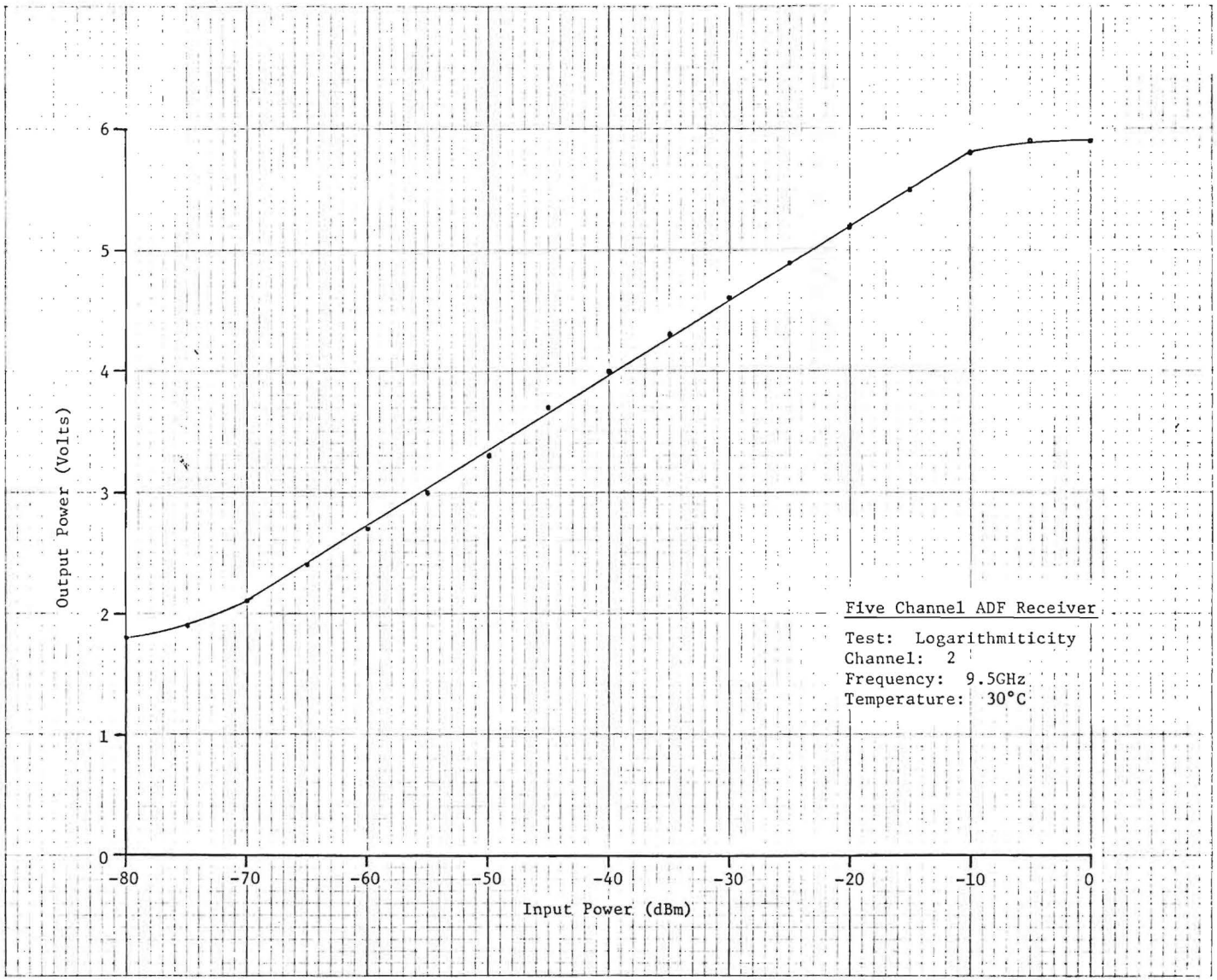
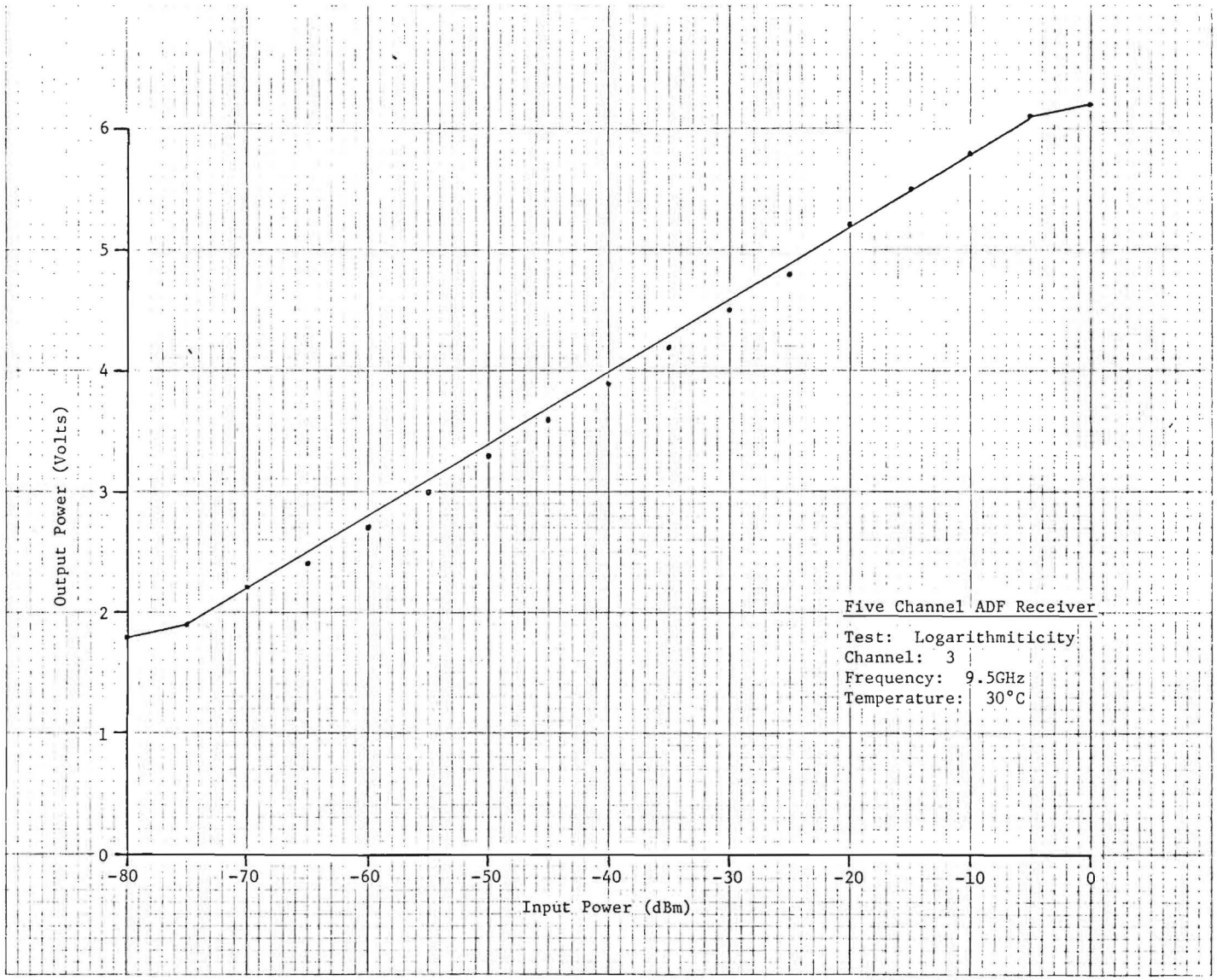
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 9.5GHz
Temperature: 25°C


6
4
3
2
1
0
Output Power (Volts)
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 9.5GHz
Temperature: 25°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 9.5GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 9.5GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
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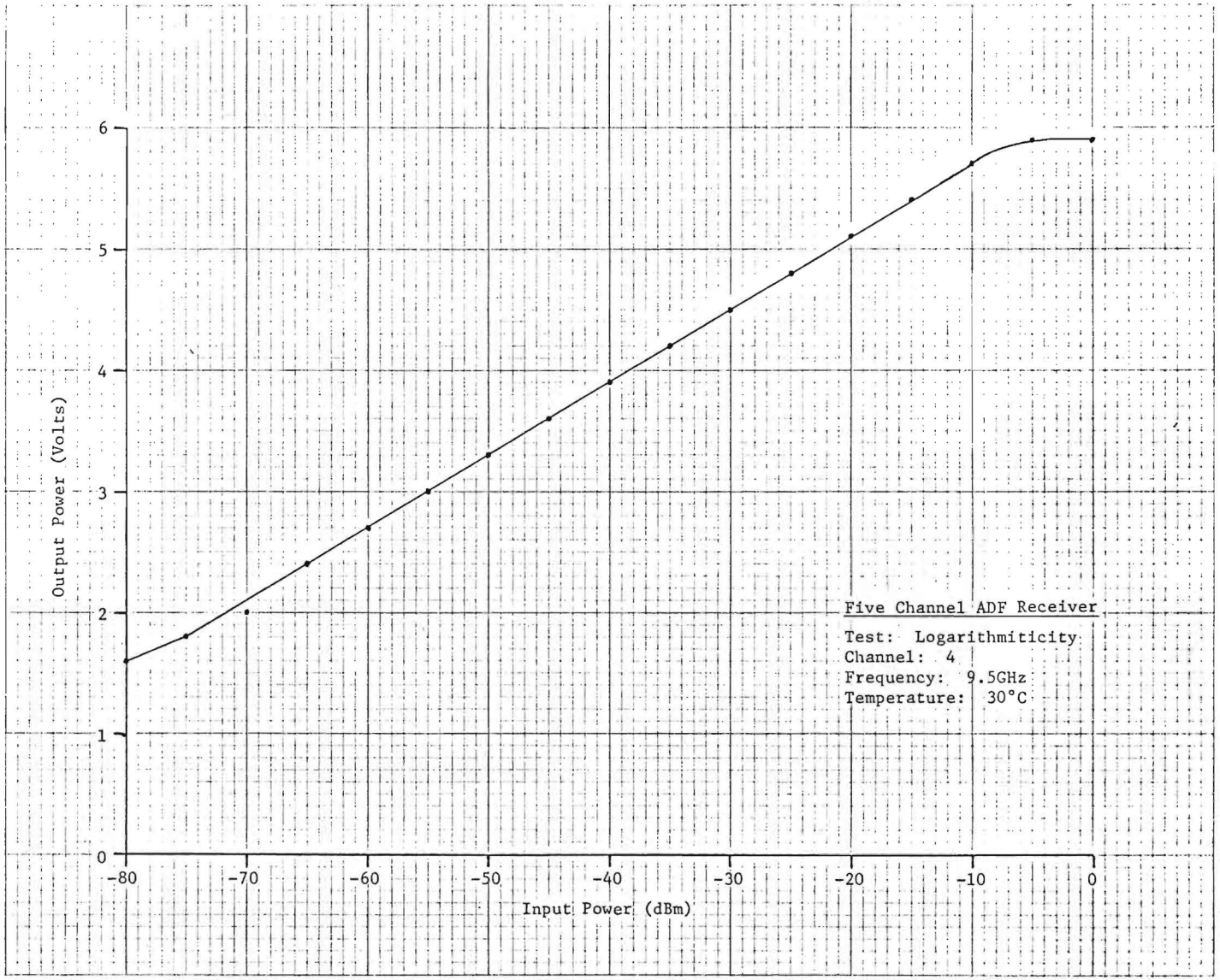
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 9.5GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
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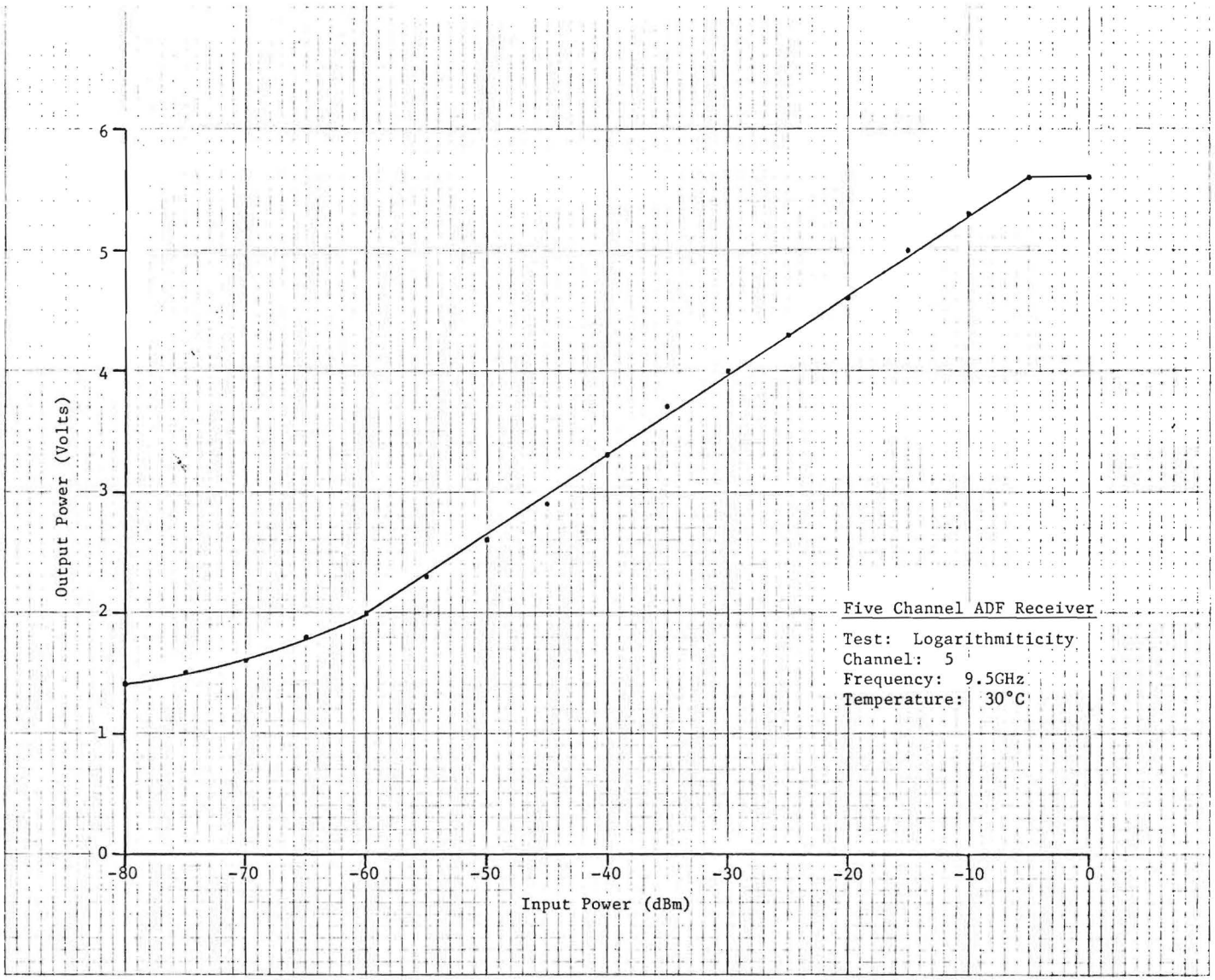
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 9.5GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
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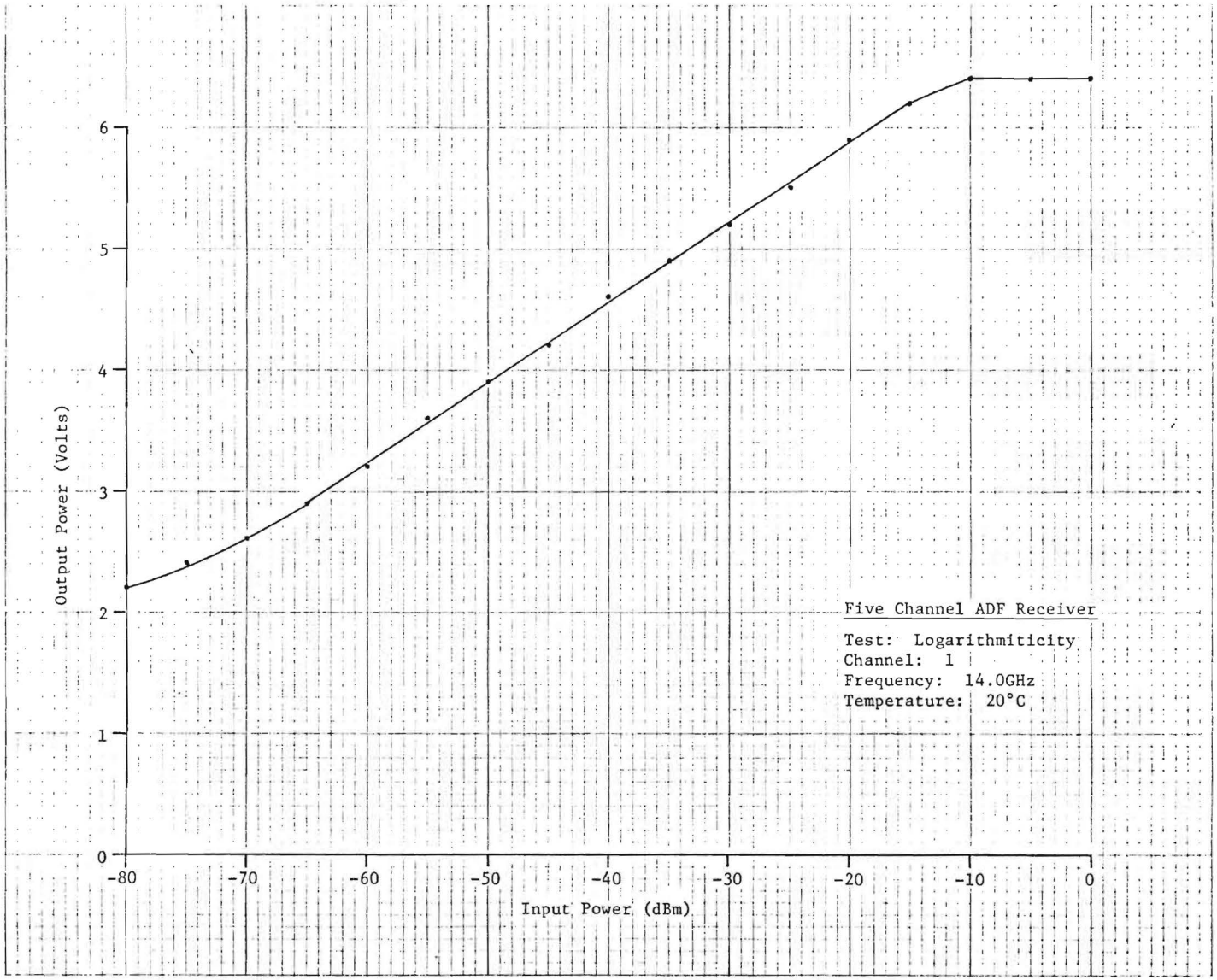
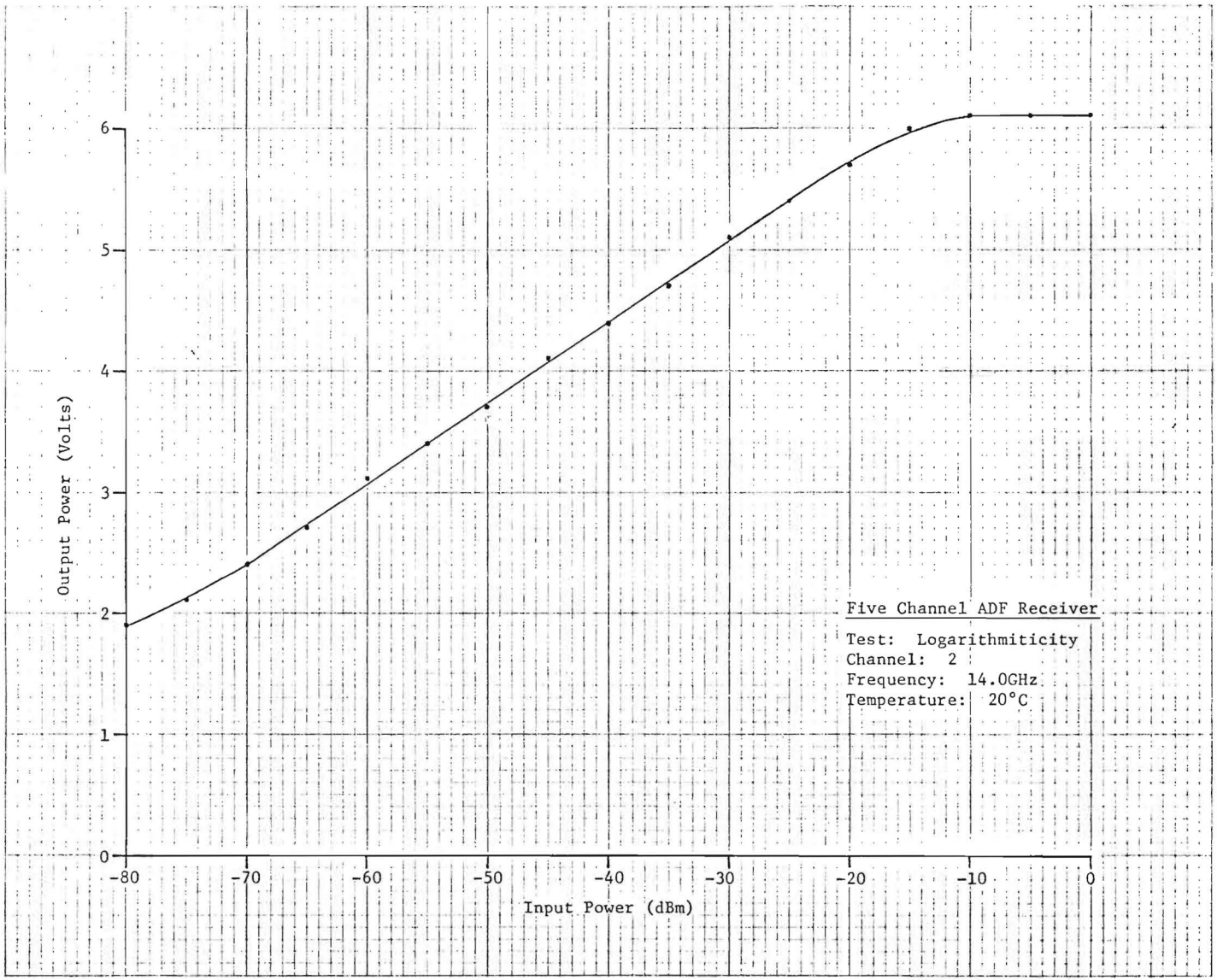
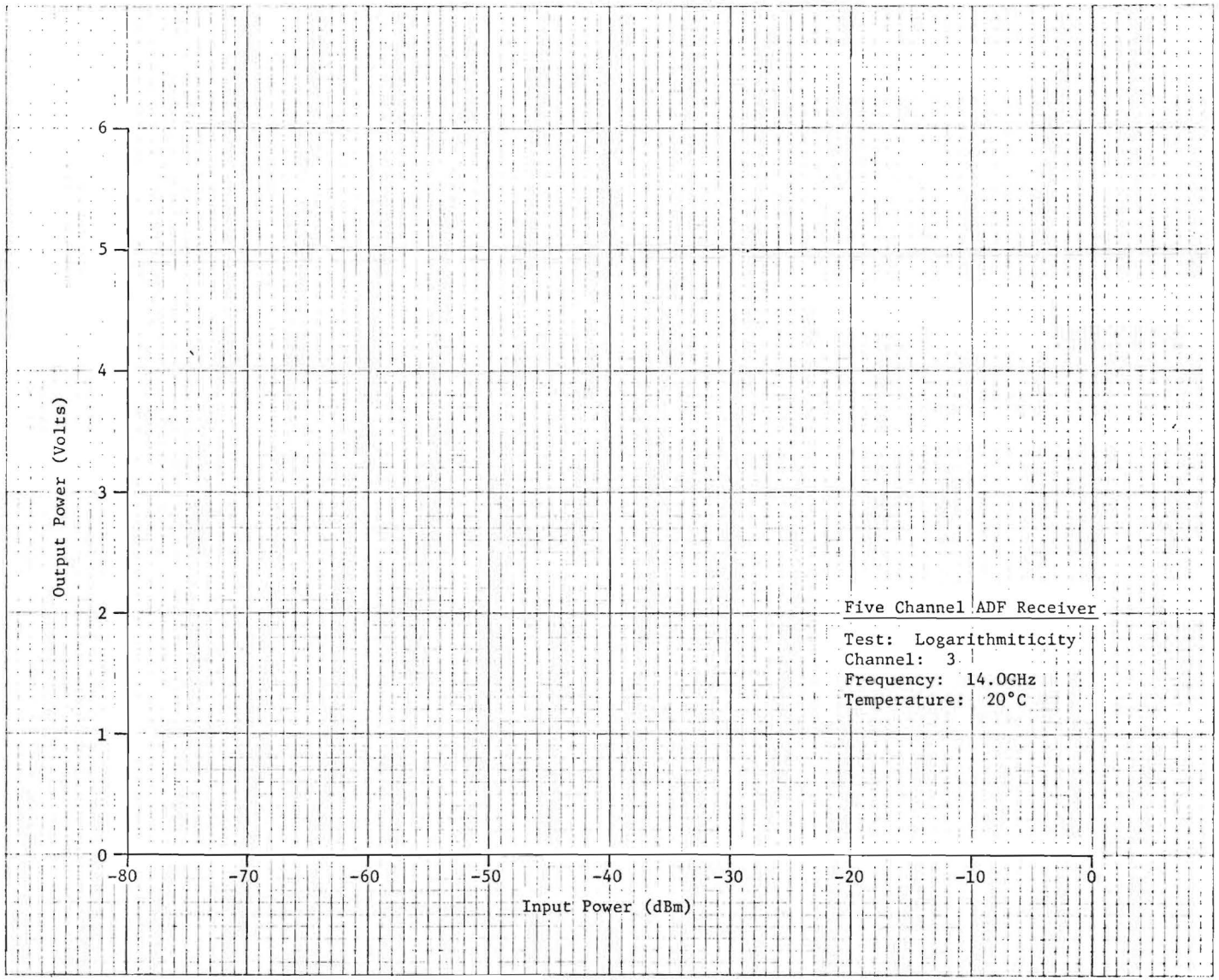
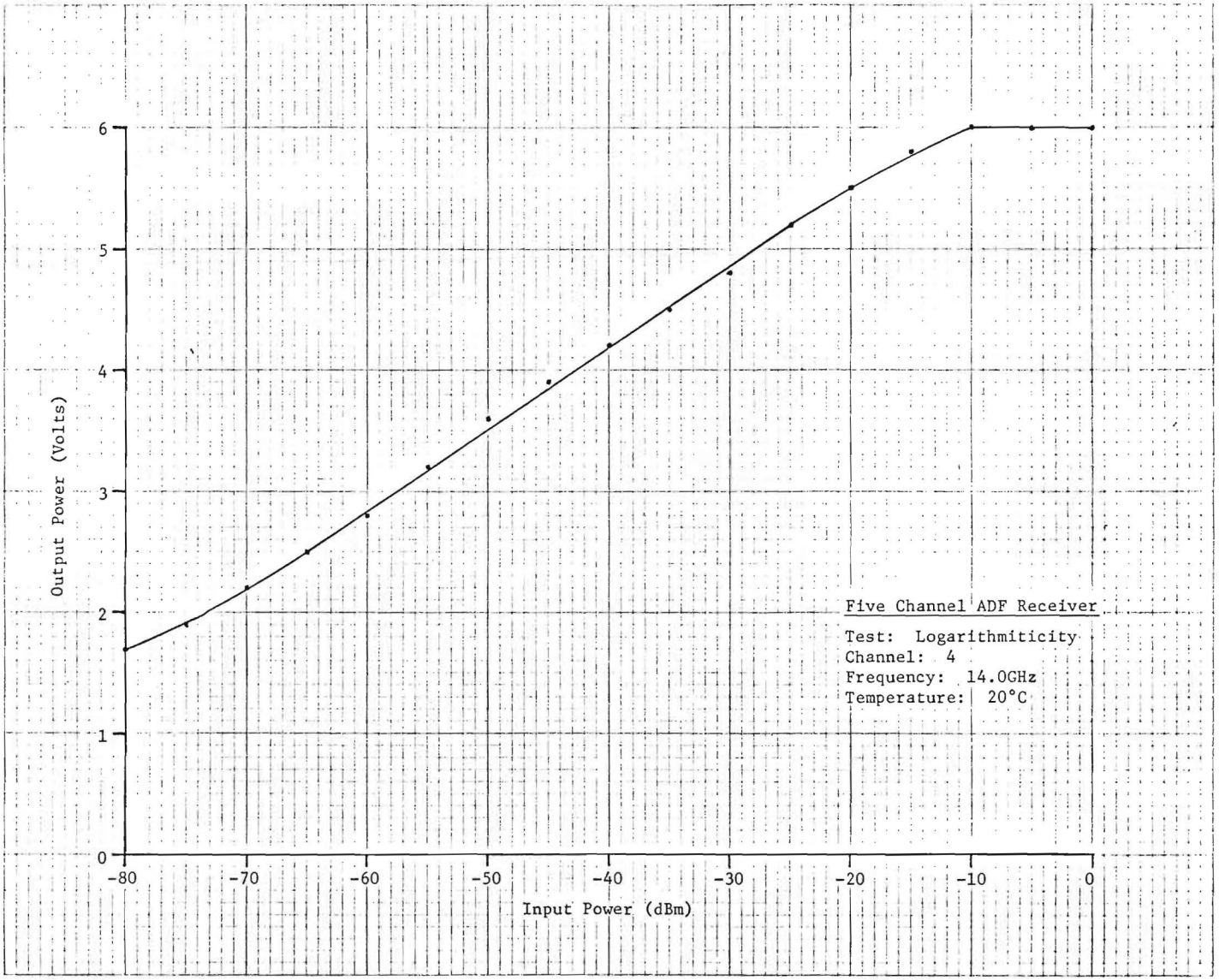
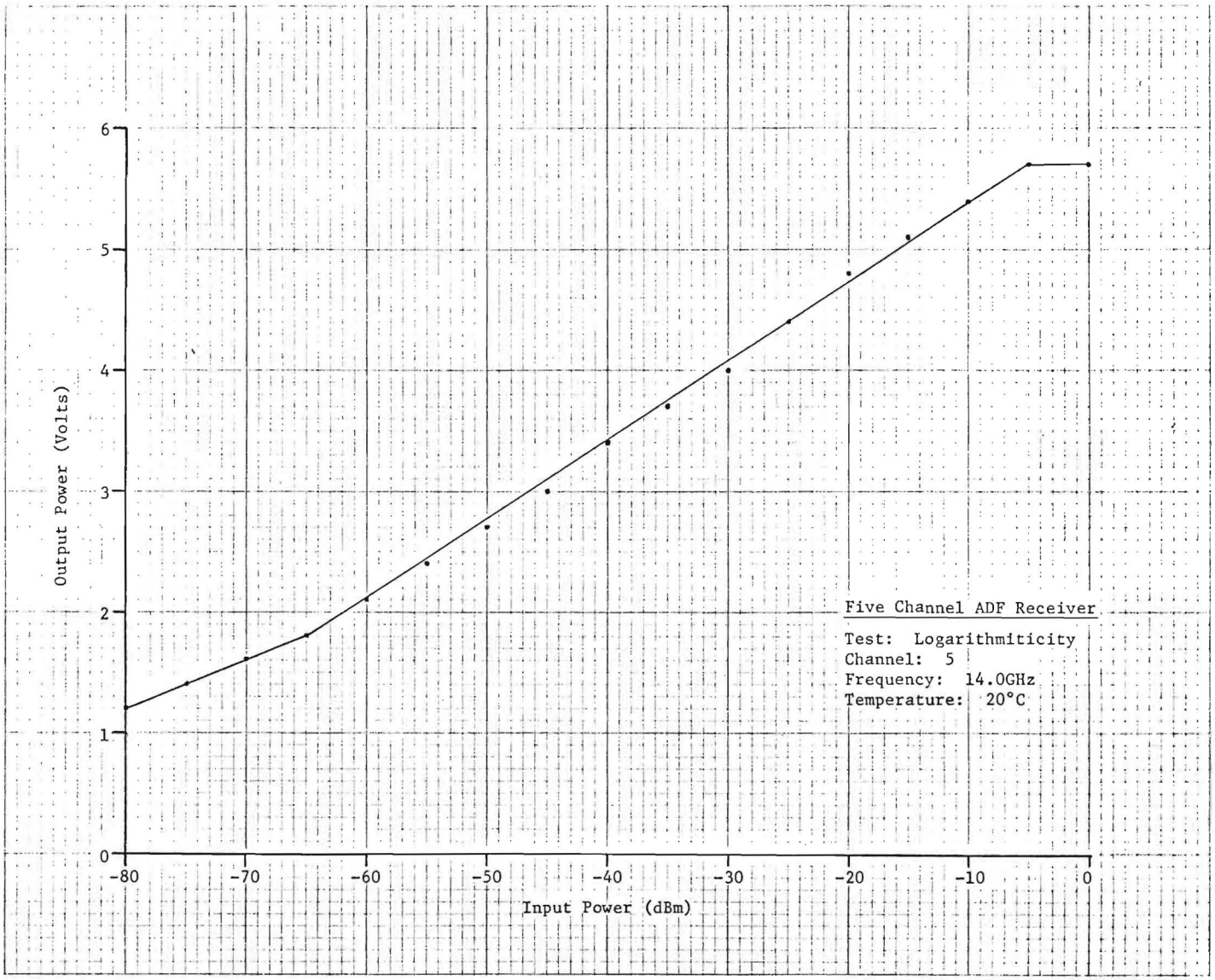
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 9.5GHz
Temperature: 30°C

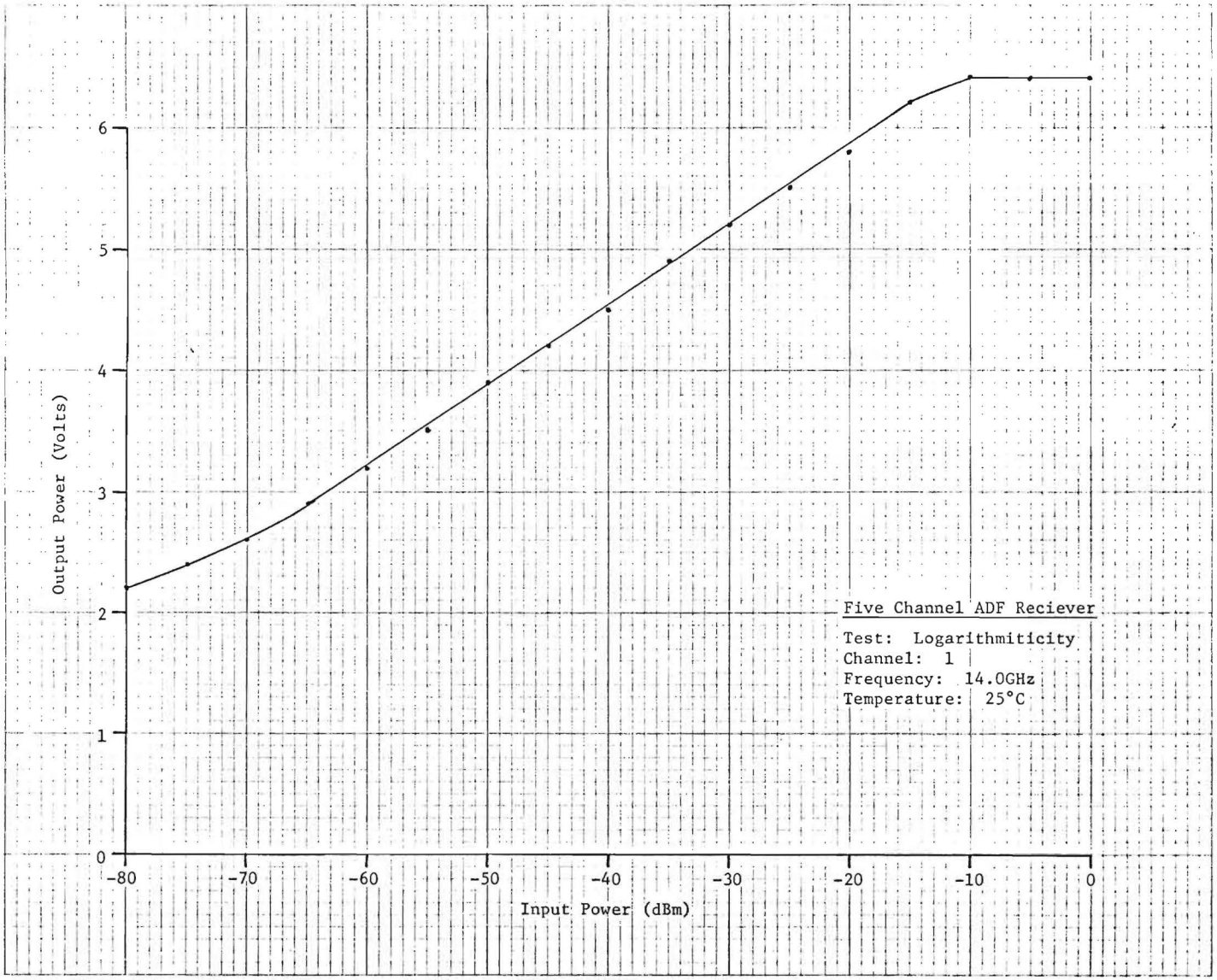

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 14.0GHz
Temperature: 20°C

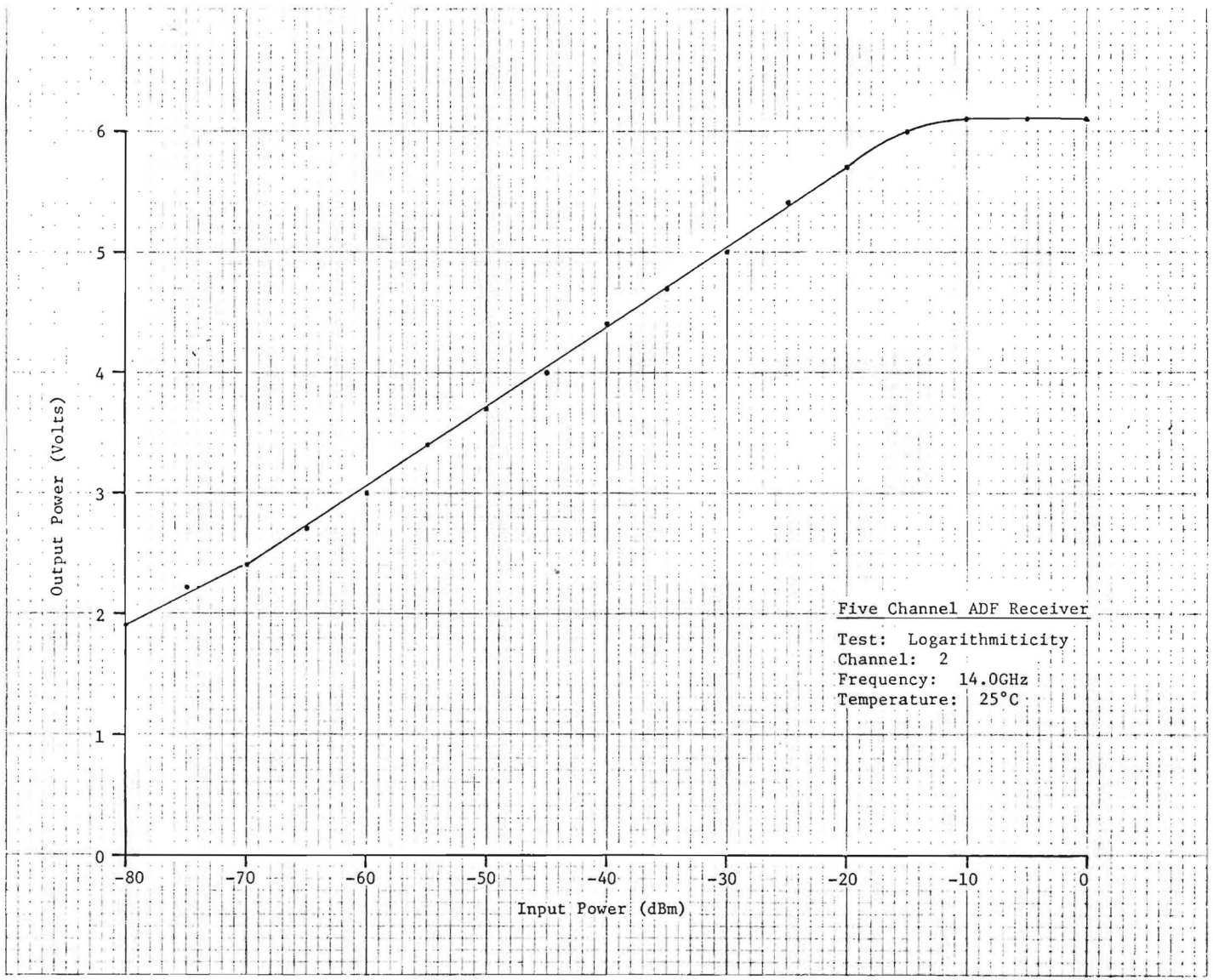

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 14.0GHz
Temperature: 20°C

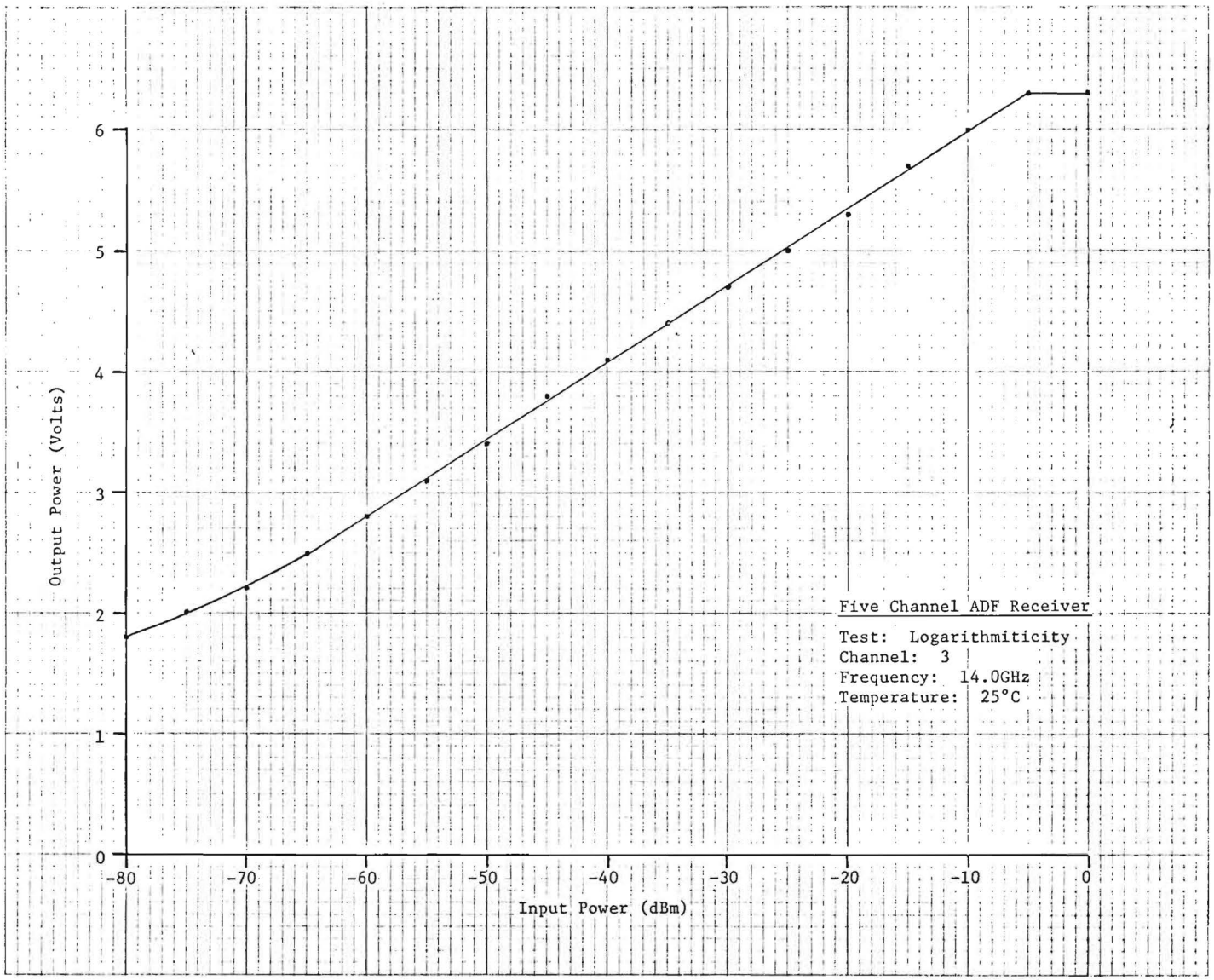

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 14.0GHz
Temperature: 20°C

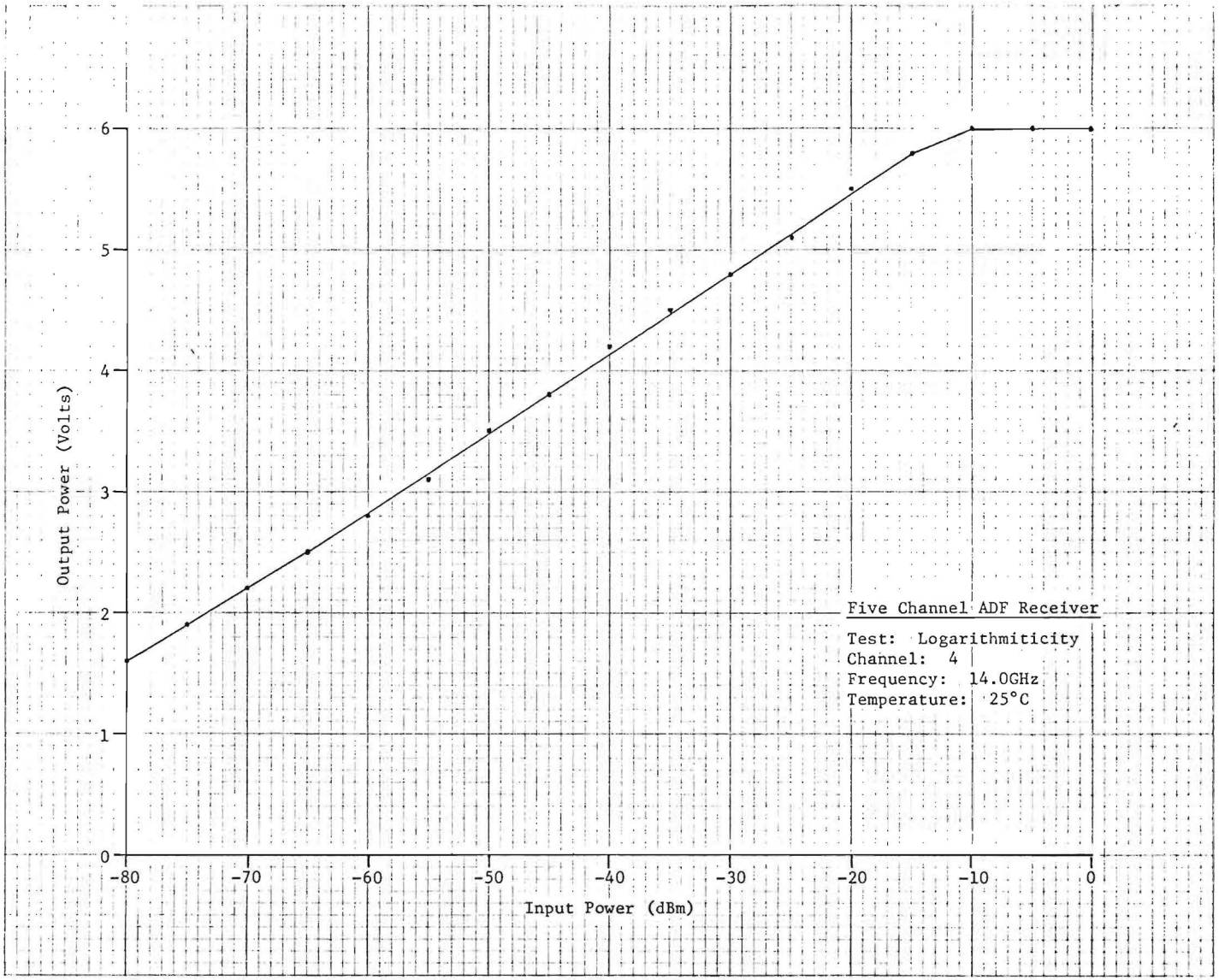

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 14.0GHz
Temperature: 20°C

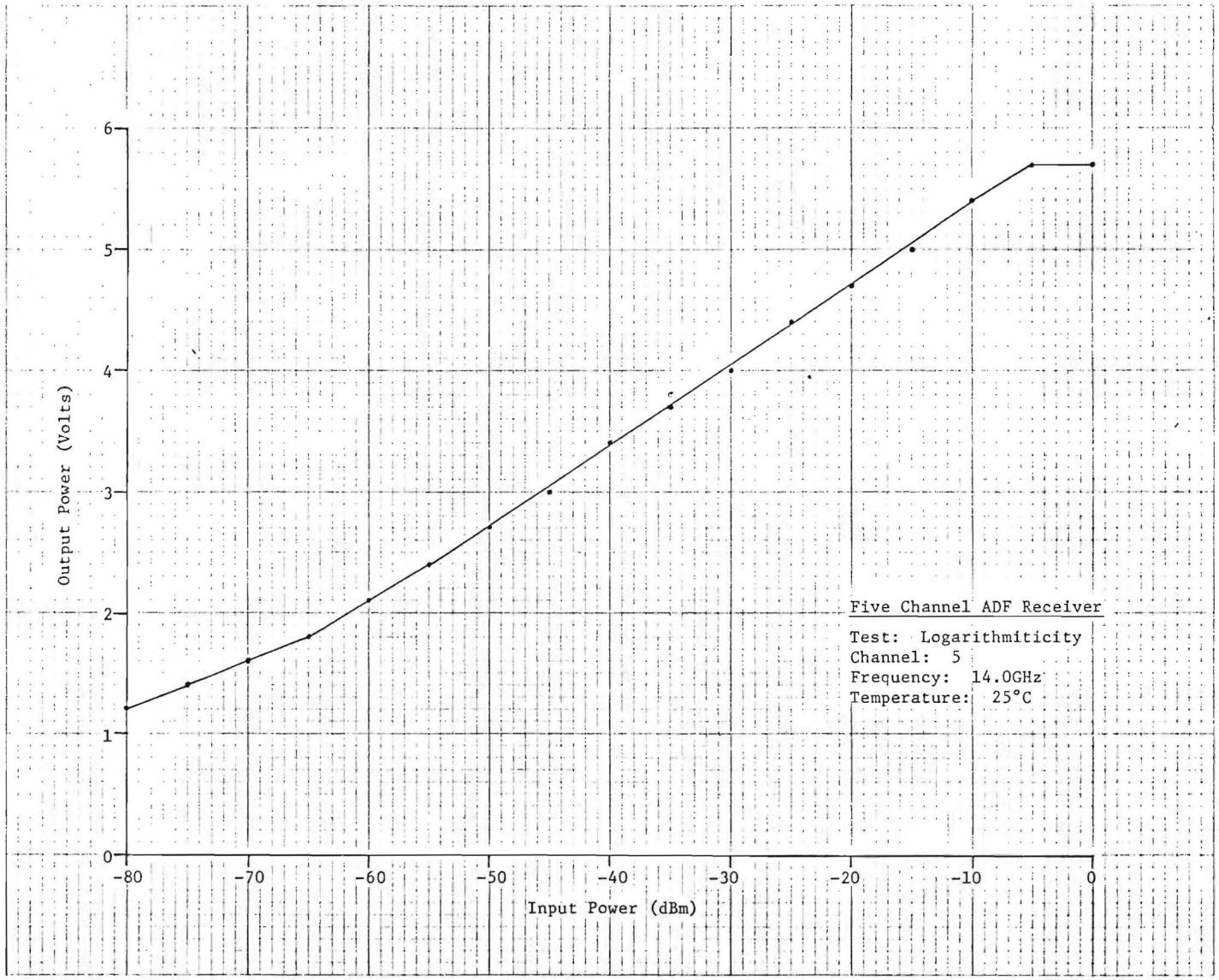

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 14.0GHz
Temperature: 20°C

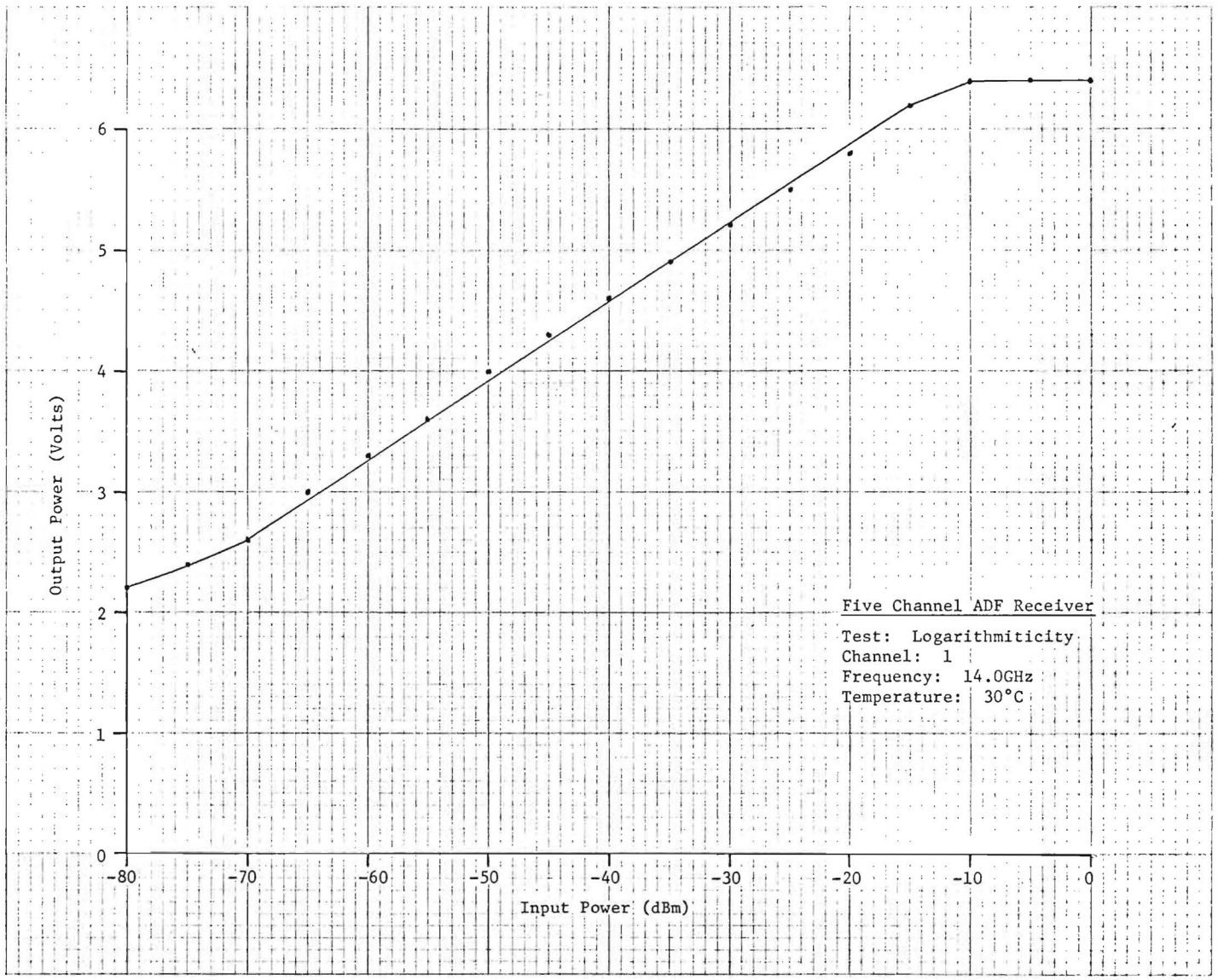

Output Power (Volts)
0
1
2
3
4
5
6
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Reciever
Test: Logarithmiticity
Channel: 1
Frequency: 14.0GHz
Temperature: 25°C

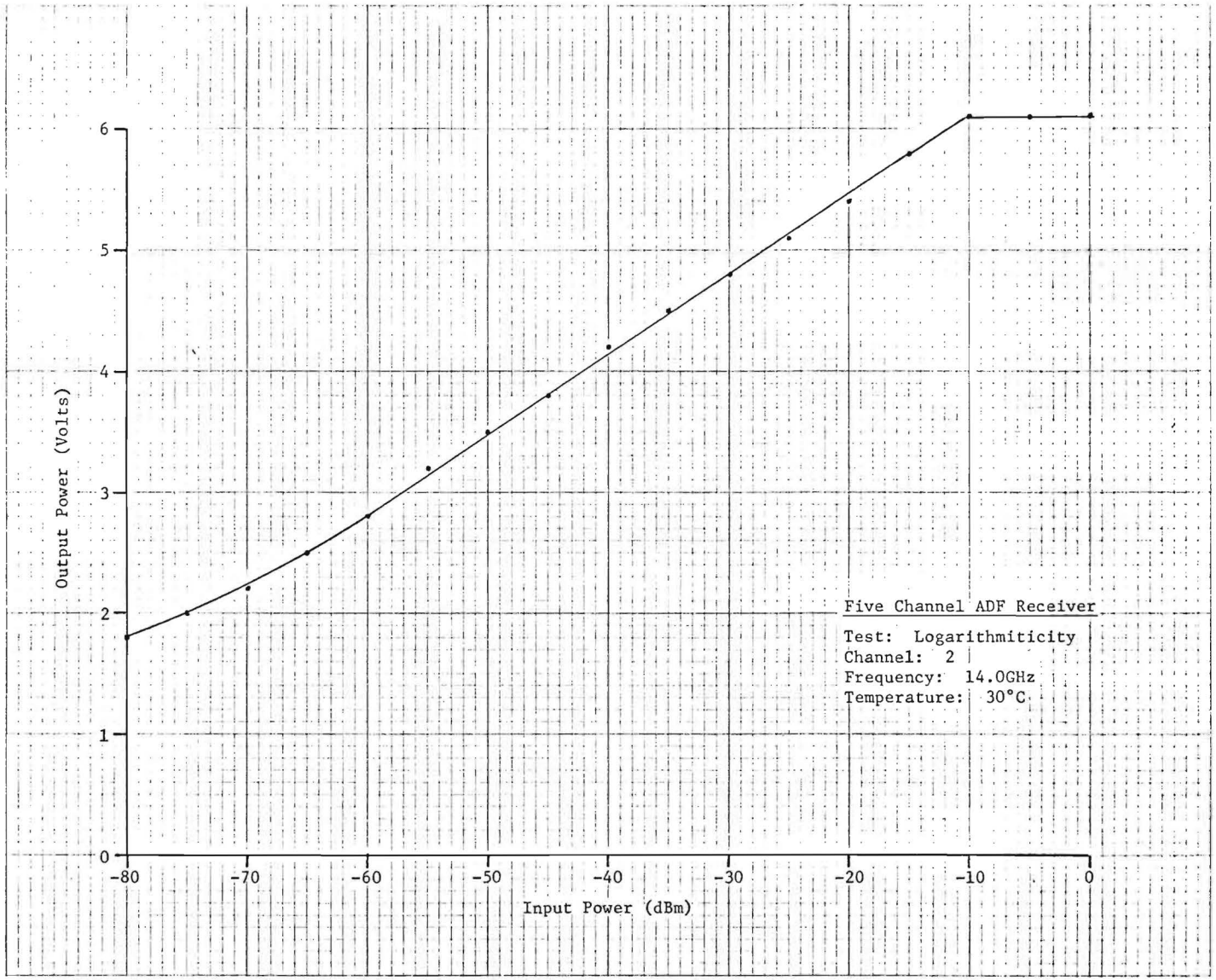

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 14.0GHz
Temperature: 25°C

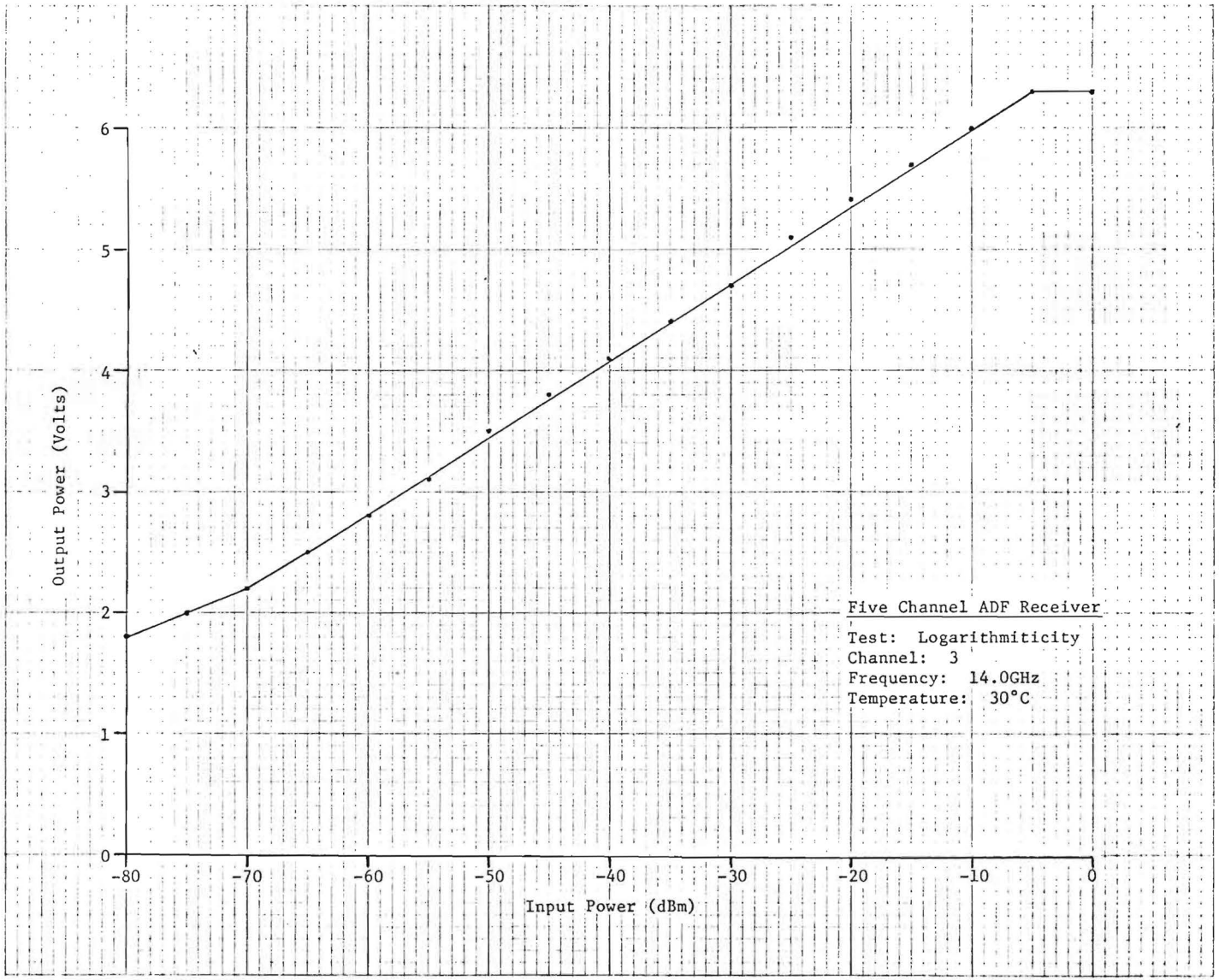

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 14.0GHz
Temperature: 25°C

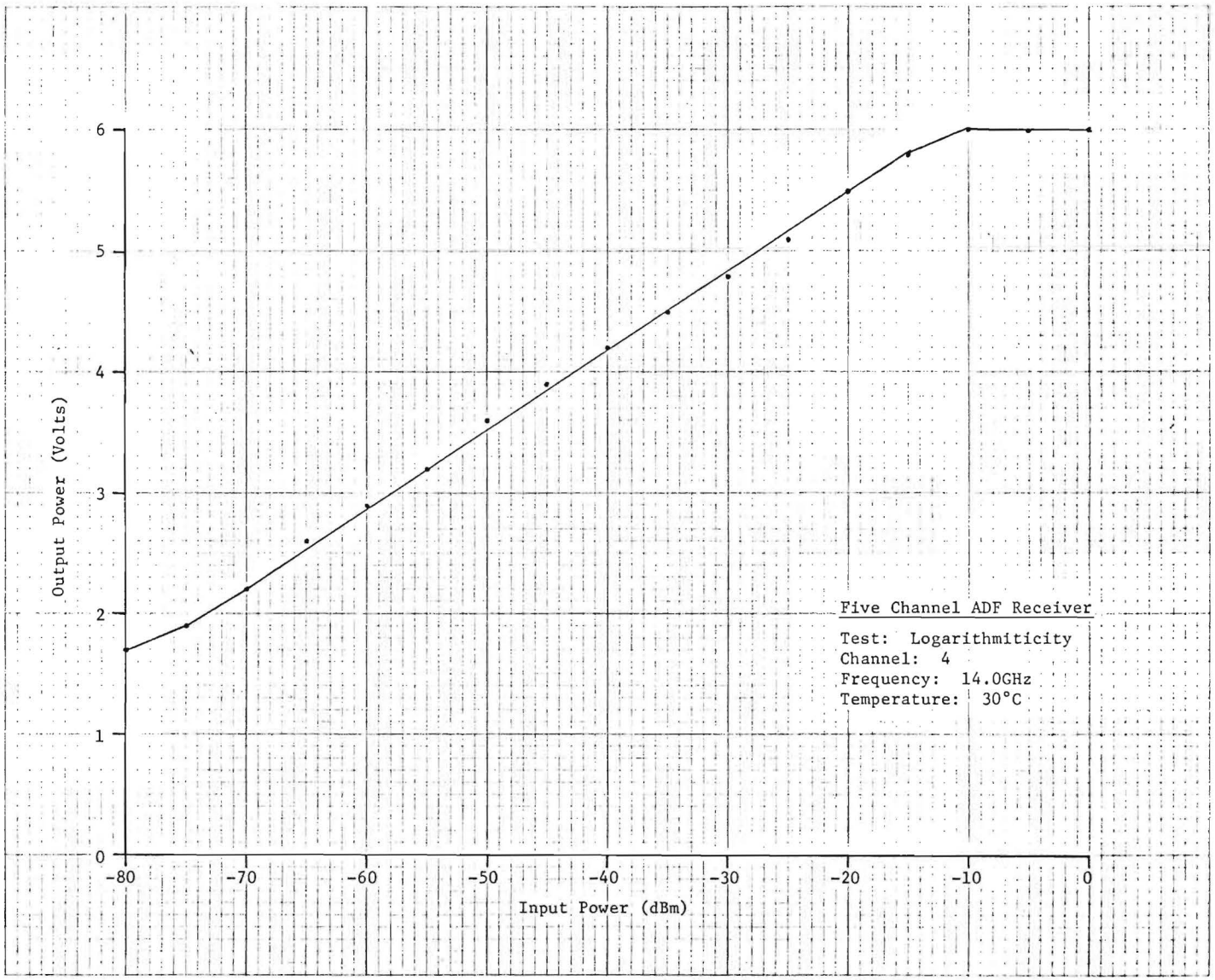

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 14.0GHz
Temperature: 25°C

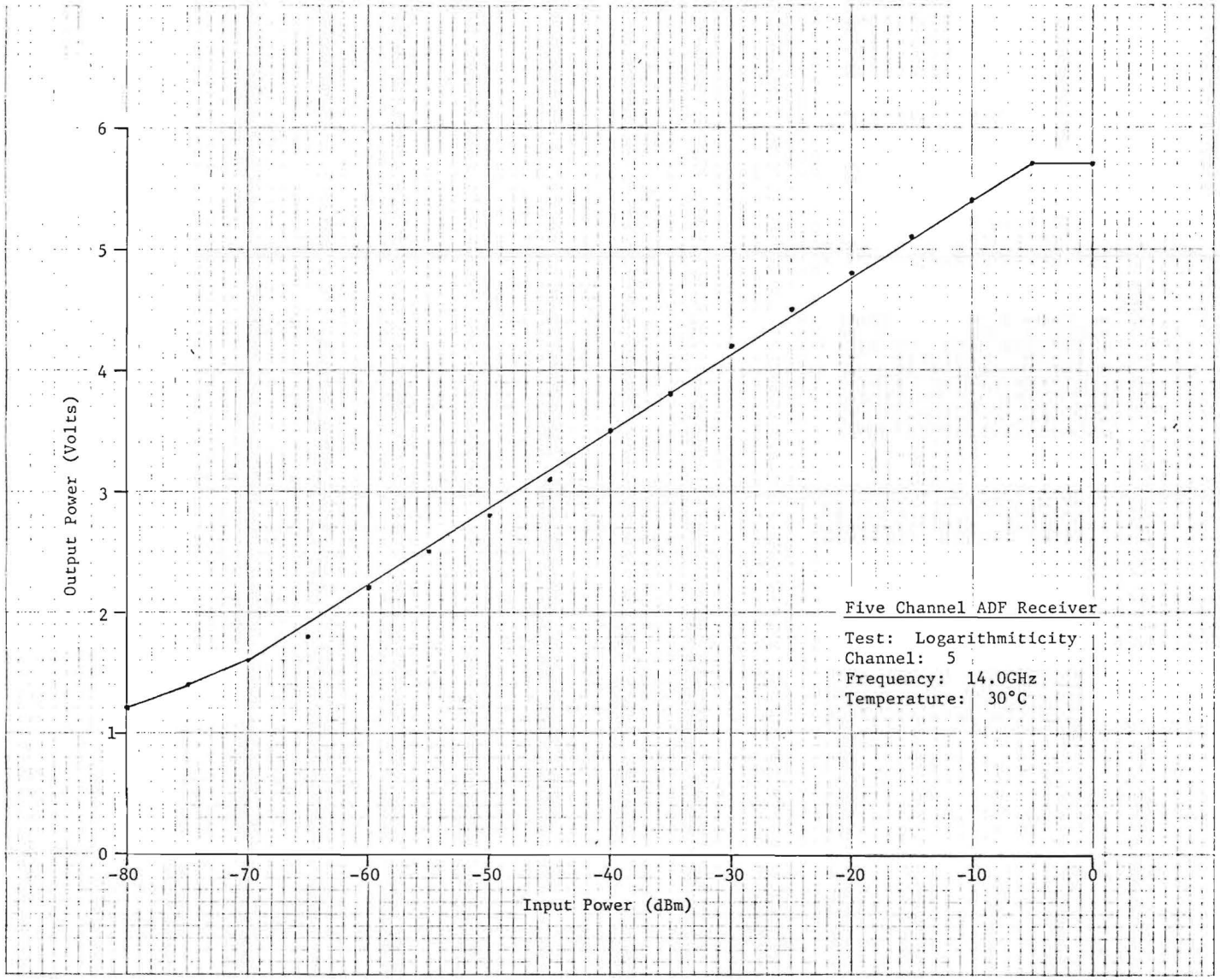

Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 14.0GHz
Temperature: 25°C


Output Power (Volts)
0
1
2
3
4
5
6
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 1
Frequency: 14.0GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 2
Frequency: 14.0GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 3
Frequency: 14.0GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 4
Frequency: 14.0GHz
Temperature: 30°C


Output Power (Volts)
6
5
4
3
2
1
0
-80
-70
-60
-50
-40
-30
-20
-10
0
Input Power (dBm)
Five Channel ADF Receiver
Test: Logarithmiticity
Channel: 5
Frequency: 14.0GHz
Temperature: 30°C